

IN INDUSTRY • IN TRANSPORTATION • ON THE SEA • IN THE AIR

DIESEL PROGRESS

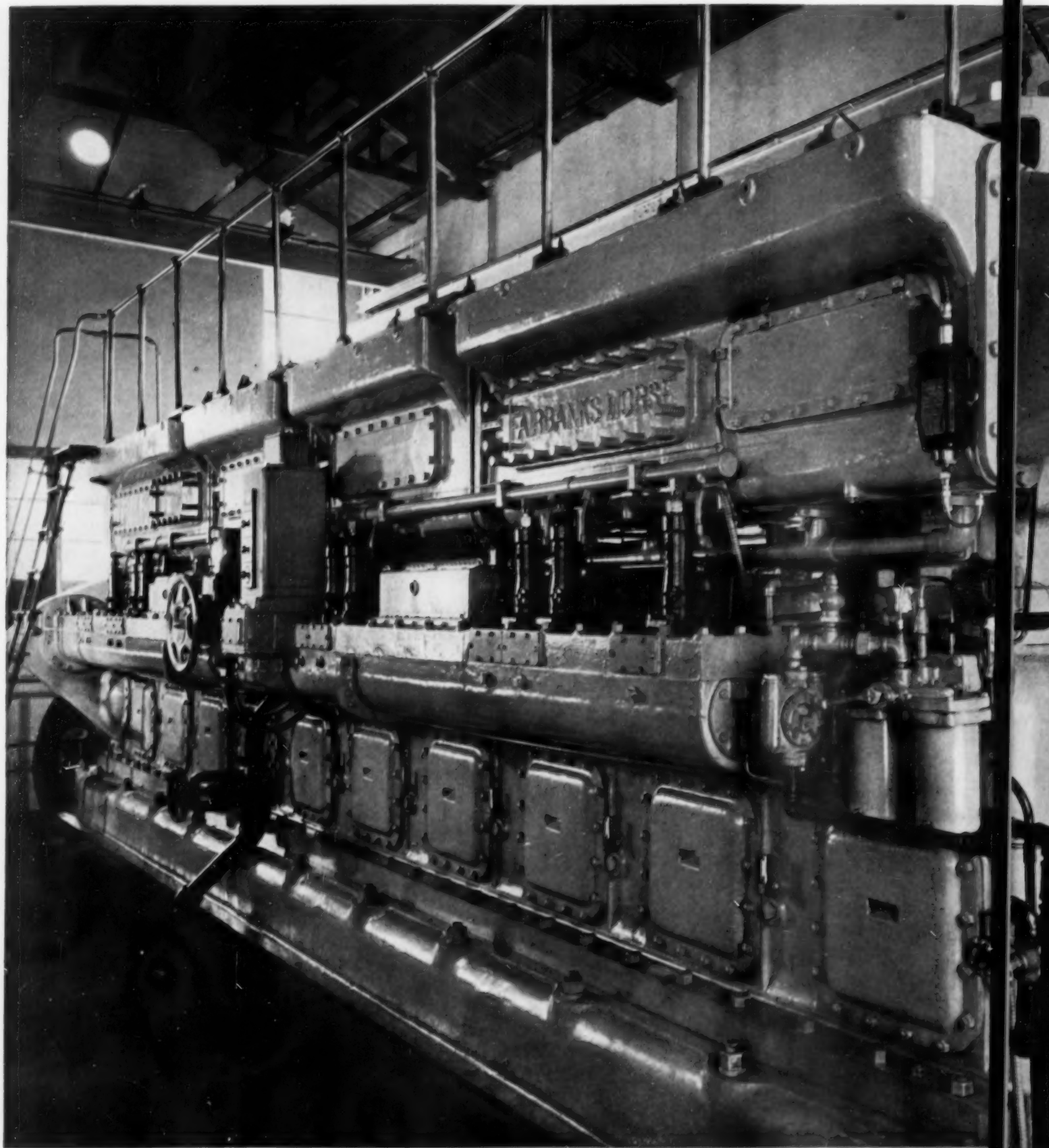


DIESELS BUILD NEW ROADS

FIVE DOLLARS PER YEAR

FEBRUARY, 1956

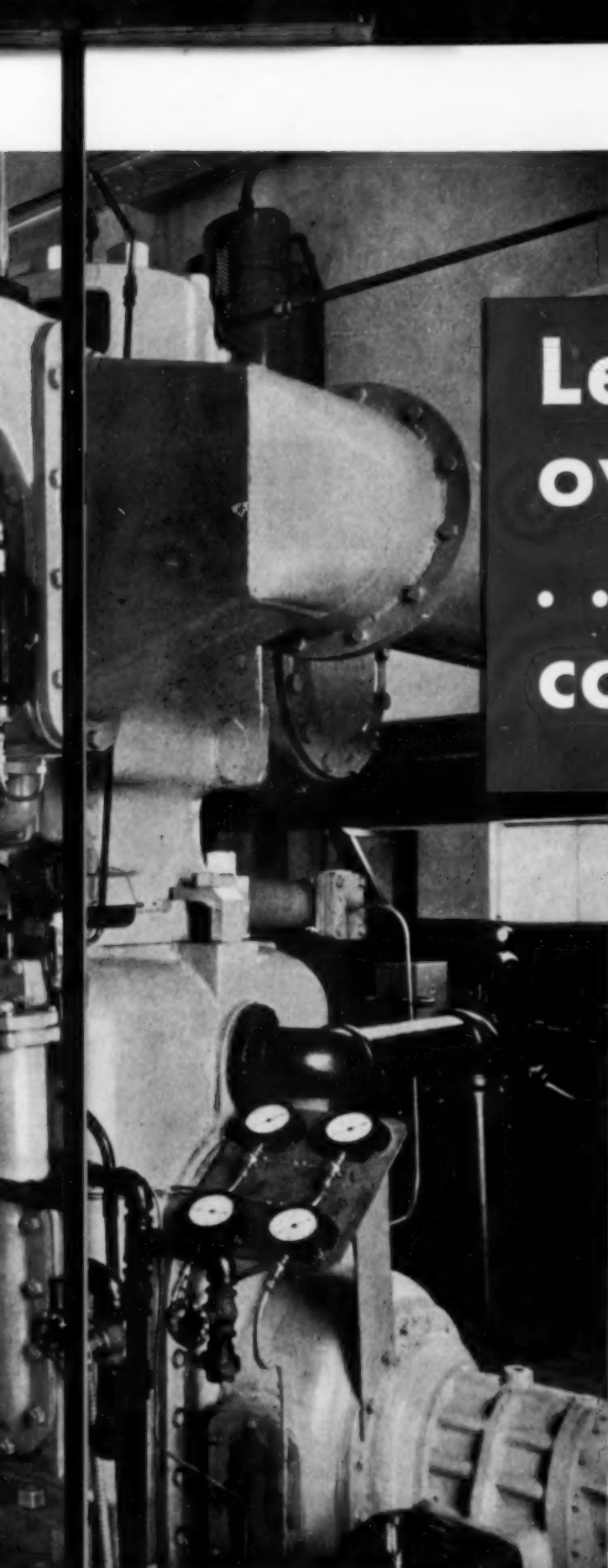
FIFTY CENTS PER COPY



TUNE IN:
TEXACO STAR THEATER
starring
JIMMY DURANTE
on TV Saturday nights.
METROPOLITAN OPERA
radio broadcasts
Saturday afternoons.



TEXACO



Less overhauling ... Less fuel consumption

Operators everywhere have discovered that lubrication with one of the famous *Texaco Ursa Oils* brings these benefits: (1) full power performance, (2) reduced fuel consumption, and (3) longer periods between overhauls.

There is a complete line of *Texaco Ursa Oils*. Whether your engines are diesel, gas or dual-fuel, you can count on the benefits listed above by letting a Texaco Lubrication Engineer help you select the proper one for your particular engines and operating conditions.

Proof of Texaco superiority in this field is evidenced by the fact that—

For over 20 years, more stationary diesel h.p. in the U. S. has been lubricated with Texaco than with any other brand.

To help you improve operating efficiency and reduce maintenance costs, call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street,
New York 17, N. Y.

URSA OILS

FOR ALL DIESEL, GAS
AND DUAL-FUEL ENGINES

Torque Converter power-packages on three cranes

**save \$60⁰⁰ a day
in fuel costs alone!**



Close-up of Caterpillar D315 Diesel Engine, driving through a Twin Disc Model CF Torque Converter. This powerful combination is used by the Valentine-Clark Corporation of St. Paul, Minn., to power their Link-Belt Crane, shown below.

A Twin Disc Torque Converter, on each of three cranes, is saving the Valentine-Clark Corporation of St. Paul, Minn., \$20 a day in fuel costs alone—or a total of \$60 for all three.

This company chemically treats poles to prevent destruction by weather and insects. Logs are shipped in from the West Coast, debarked and then chemically treated. The three cranes are used to unload the logs into treating pits, and to reload them for shipment.

This equipment includes one Link-Belt and two American Hoist & Derrick Cranes—all of which are equipped with Caterpillar D315 Diesel Engines, driving through Twin

Disc Model CF Torque Converters.

Each of the cranes has been converted from steam power, and since switching to the powerful diesel engine-torque converter combination, several advantages have been realized. According to Lawrence Martin, Superintendent of Valentine-Clark, "In addition to our \$20 a day saving in fuel—*per crane*, we've increased production more than 20%. We've also decreased labor costs in eliminating time consumed to fire boilers, and to make water stops."

The next time you repower or purchase new equipment—specify a *Twin Disc Torque Converter* for a smoother, easier, more flexible flow

of power (up to 6:1 multiplication) and for longer equipment life through cushioning of shock loads. *Your* production will *increase* . . . your costs will *decrease*. Contact your engine dealer for more information. Twin Disc Clutch Company, Racine, Wisconsin, Hydraulic Division, Rockford, Illinois.



TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois

BRANCHES OR SALES ENGINEERING OFFICES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • TULSA

DIESEL and GAS ENGINE PROGRESS

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IN INDUSTRY • IN TRANSPORTATION • ON THE SEA • IN THE AIR

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EDITORIAL AND PRODUCTION OFFICES

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Los Angeles 46, Calif.

BUSINESS OFFICES

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FRONT COVER
ILLUSTRATION

Typical of the rugged performance expected of dieselized equipment in this loader on a road building project in the mountainous Rockies.

new

DESIGNED AND BUILT IN THE SAME WORKSHOPS AS THE WORLD FAMOUS SAPPHIRE JET AERO ENGINES

The latest addition to the
ARMSTRONG SIDDELEY

range of



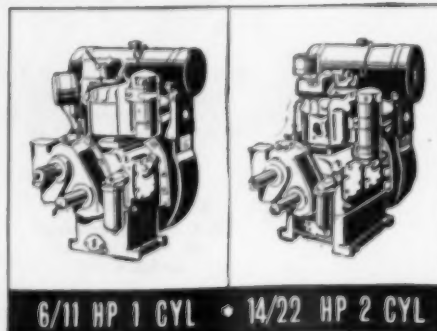
DIESEL AIR COOLED engines

The outstanding 20-33 h.p. 3-cylinder model

Air cooled for simplicity and reliability. Light weight—highly efficient in all climates—low fuel consumption. All parts accessible and maintenance costs low—minimum dimensions.

Armstrong Siddeley diesel power units are fitted by leading manufacturers of equipment for agriculture, industry, and marine use, including: Atlas Diesel Ltd., Aveling-Barford Ltd., B.T.H. Ltd., International Harvester Co. of Gt. Britain Ltd., Massey-Harris-Ferguson Ltd., Parsons Engineering Co. Ltd., Ransomes, Sims & Jefferies Ltd. From 6-33 h.p., one, two, three cylinders—most parts interchangeable.

ARMSTRONG SIDDELEY MOTORS LIMITED
PARKSIDE . COVENTRY . ENGLAND
MEMBERS OF THE HAWKER SIDDELEY GROUP



6/11 HP 1 CYL • 14/22 HP 2 CYL

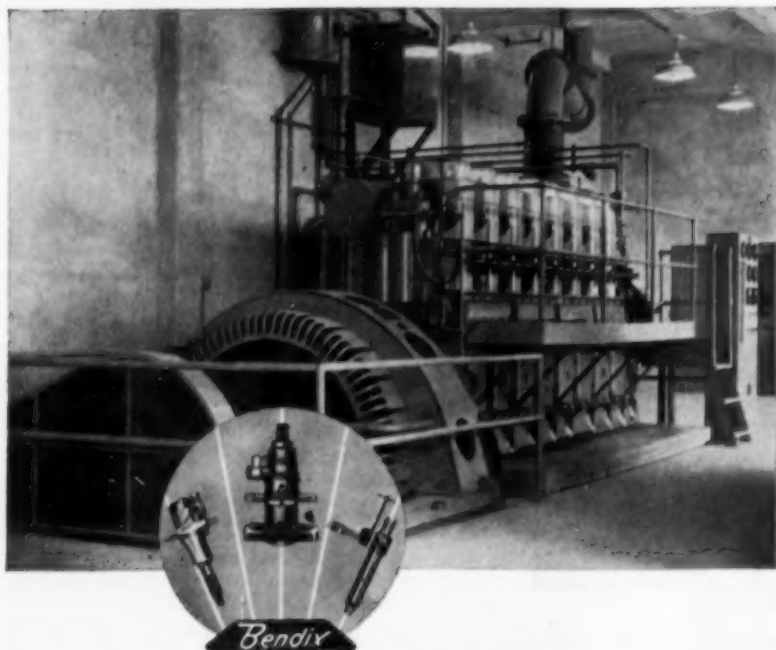
DIESEL PROGRESS

Keeping San Francisco's new International
Airport ready for any power emergency . . .



ENTERPRISE 1000 KW DIESEL GENERATOR WITH

Bendix FUEL INJECTION EQUIPMENT!



Providing emergency lighting facilities for the vast, new San Francisco International Airport is no small task. Add to this the job of powering pumps connected to the field's drainage system, in case of floods, and you have still another chore that takes on herculean proportions. Yet, the Enterprise Diesel Generator with Bendix* Fuel Injection Equipment, set for standby duty at this modern new airport, is prepared to handle either of these functions!

As you can appreciate, specifications met by Enterprise Engineers in making this installation were rigid. In addition to assuming full load within 15 minutes after starting, it was required that the Bendix equipped power plant provide continuous full load operation for weeks or even months without "shutdown." In all tests prior to acceptance by city officials, this mighty standby generator not only met, but actually surpassed, these rugged requirements!

Here, once again, is proof that when operating conditions demand unfailing dependability, Bendix Fuel Injection Equipment is the choice of leading diesel engine manufacturers.

*REG. U.S. PAT. OFF.

SCINTILLA
DIVISION

Bendix
AVIATION CORPORATION

Mississippi Valley Barge Line launches the two most powerful
twin-screw towboats
ever to enter river service

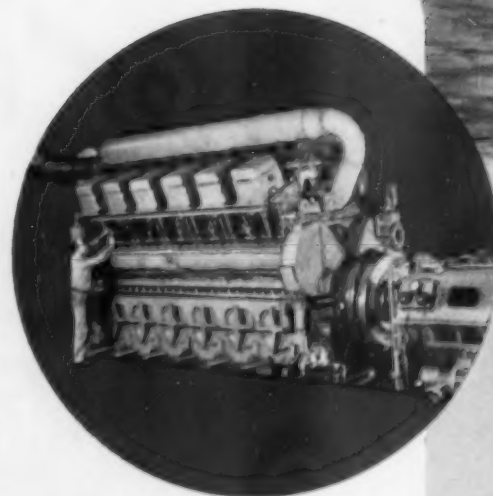


**TWO NORDBERG V-TYPE
SUPAIRTHERMAL® DIESELS
power each vessel**

With the recent launching of the ultra-modern towboats *A. D. HAYNES II* and *VALLEY TRANSPORTER*, a new milestone was reached in the history of Inland Waterways transportation . . . for these two vessels are the most powerful twin-screw towboats ever built for river service.

These 200 foot pusher type vessels, built by the Dravo Corporation for the Mississippi Valley Barge Line Company, will operate on the lower Mississippi River between St. Louis, Mo. and New Orleans. In keeping with the latest concepts of marine design and construction, each towboat is powered by two Nordberg 12-cylinder, V-type Supairthermal Diesels. These powerful yet compact 4-cycle engines, of 13" bore and 16½" stroke, were furnished in matched, opposite rotation pairs, each connected to a special oil operated reverse-reduction gear.

Modern in every respect, these two towboats will soon be setting the pace for efficient river transportation. The performance of the powerful Nordberg Supairthermal Diesels will be of interest to rivermen the world over. Nordberg Mfg. Co., Milwaukee, Wisconsin



One of the Nordberg Supairthermal engines shown on a test stand prior to shipment. Each engine drives an oil operated Hindmarch-DeLaval reverse-reduction gear through a tangential spring coupling.



Builders of America's Largest
Line of Heavy Duty Engines,
from 10 to over 12,000 H.P.

© 1956, Nordberg Mfg. Co.

ONE OF AMERICA'S UNIQUE INDUSTRIES FACES DESTRUCTION

Unlimited Imports of Frozen Tuna Has Stopped Tuna Clipper Construction; Idled the Great Pacific Tuna Fleet and Stopped Purchases from 300 Suppliers Scattered Over All Parts of the Nation

HERE ARE THE FACTS!

1. IMPORTS OF FROZEN TUNA		6. INDEX OF PRICES PAID FOR FISH TO AMERICAN PRODUCERS	
1948	9,143,000 lbs.	1948	100.0
1955	172,000,000 lbs.	1955	69.4
2. PERCENTAGE OF U.S. CONSUMPTION IMPORTED		7. INDEX OF PROFIT ON SALES TO PROCESSORS	
1948	2.8%	1948	100.0
1955	72.4%	1955	MINUS 44.2
3. IMPORTS OF CANNED TUNA		8. DECLINE IN THE BAIT BOAT FLEET	
1948	8,302,000 lbs.	1952	210 vessels
1955	32,162,400 lbs.	1955	165 vessels
4. DOMESTIC PRODUCERS' SHARE OF THE U.S. MARKET		A decline of 21% and 14% in Capacity IN JUST 3 YEARS	
1948	91.4	9. JAPANESE HIGH SEAS TUNA FLEET	
1955	46.1	1951	272 vessels
5. INDEX OF FISHERMEN'S EARNINGS		1955	436 vessels
1948	100.0	An increase of 60% and 151% in Capacity IN JUST 4 YEARS	
1955	60.0		
10. ONLY FOUR U.S. TUNA CLIPPERS COMMISSIONED FROM 1953-1955			

A GRIM PICTURE FOR A GREAT INDUSTRY

With per-vessel production off 30%; our share of the market down to less than 50% of consumption; vessel employment down 20%; Share Earnings down 40% and profits changed to losses.

IMPORTS OF TUNA ARE UP 1300% AND THE FOREIGN SHARE OF OUR MARKET IS NOW PAST 50%. ALL WHILE CONSUMPTION OF TUNA IN THE U.S.A. HAS GROWN RAPIDLY.

The great Pacific Fleet, the most efficient and highly mechanized fishing vessels ever created, involves not only the Operating and Owning Personnel, all of whom work on Shares, but the North Pacific Shipyards that produce these magnificent Diesel ships; Diesel Engine builders and Supply & Equipment industries scattered in 35 States all face a total loss of their great market in the fishing industry.

IMMEDIATE ACTION BY CONGRESS AND THE ADMINISTRATION IS NECESSARY TO SAVE THE INDUSTRY FROM RUIN

Ills of the Tuna Industry are already pressing hard on the great Salmon, Crab, Halibut and Herring fisheries of the Nation.

Write, Wire or Phone—

TACOMA SHIPYARD ASSOCIATION

Allen Petrich, President

C. M. Bevis, Secretary-Treasurer

J. S. Martinac, Vice-President

2509 East 11th St., Tacoma 2, Washington

MEMBER FIRMS: Birchfield Boiler Inc., Shipbuilding Division; Cummings Boat Co.; Kazulin Cole Shipyard; Peterson Boatbuilding Co.; Puget Sound Boat Building Co.; J. M. Martinac Shipbuilding Corp.; Tacoma Boatbuilding Co., Inc.; Western Boatbuilding Co.

The Engineer's Field Report

CASE HISTORY

RPM DeLo Oil RR Special
LUBRICANT

Northern Pacific Railway,
FIRM *Missoula, Montana*

Diesel still using original rings, bearings after 140,000 miles on mountain freight run



FOUR PERCENT GRADES and 16-degree curves make Northern Pacific's run through Lookout Pass a severe test for diesels. Locomotives haul ore and heavy equipment between Wallace, Idaho, and St. Regis, Montana, on a daily round-trip schedule of 114 miles. Using RPM DELO Oil RR Special, a GP-7 on this run has gone 140,000 miles with original rings and bearings—and is still in service. Northern Pacific says, "We have never had any trouble with this locomotive. It is still very clean, still performing well." Three other GL-7's and a GP-9 (above) have been used on the run during a 2½-year period. Northern Pacific Railway uses RPM DELO Oil RR Special in all road diesels on this run.

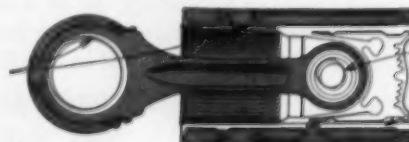
FOR MORE INFORMATION about petroleum products of any kind or the name of your distributor, write or call any of the companies listed below.



TRADEMARK "RPM DELO" REG. U. S. PAT. OFF.

Why RPM DELO Oil RR Special prevents wear, corrosion, oxidation

Special additive provides metal-adhesion qualities...keeps oil on parts whether hot or cold, running or idle.



Anti-oxidant resists deterioration of oil and formation of lacquer...prevents ring-sticking. Detergent keeps parts clean...helps prevent scuffing of cylinder walls. Special compounds stop corrosion of any bushing or bearing metals and foaming in crankcase.

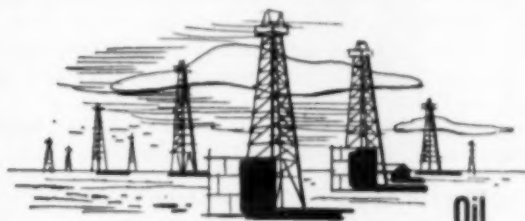
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THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey • THE CALIFORNIA COMPANY, Denver 1, Colorado



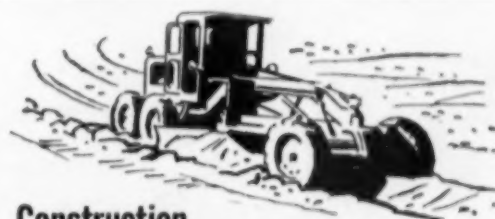
If you're in any
of these fields . . .



Marine



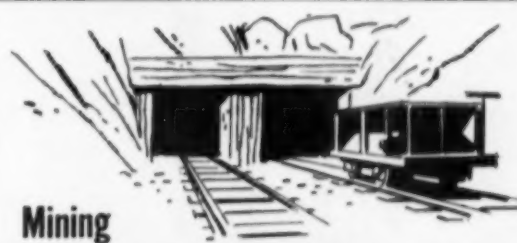
Oil



Construction



Agriculture



Mining

INVESTIGATE THE NEW



HAND-CRANKED INERTIA STARTER

This new hand-cranked inertia starter . . . available in four different models . . . is especially suited for use in remote areas and under difficult operating and climatic conditions.

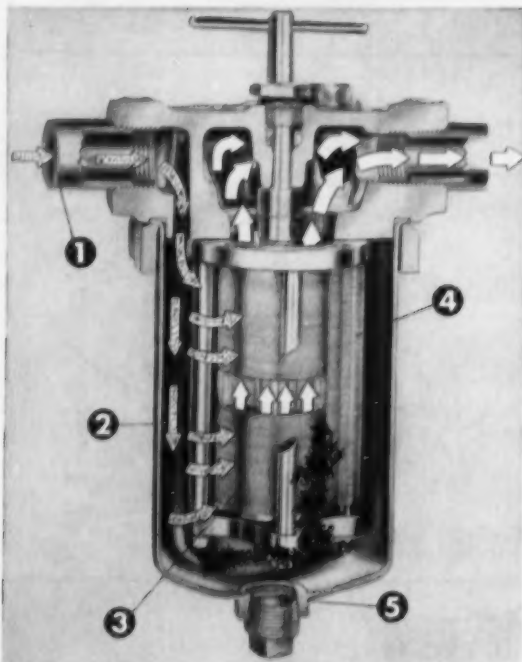
Use the Bendix AE Inertia Starter where shock conditions can damage storage batteries or disrupt voltage regulation. Use it where battery maintenance

is a problem or where there is a fire hazard. Mounts in same place as conventional starter on standard S.A.E. 3-bolt flange.

The Bendix AE Inertia Starter is simplicity itself to install. Requires No Cables—No Pumps—No Plumbing. Get full particulars today. BENDIX INTERNATIONAL DIVISION, BENDIX AVIATION CORPORATION, 205 E. 42nd St., New York 17, N. Y., Cable: "Bendixint", N. Y.



New CUNO SUPER Auto-Klean Filter can boost engine life up to 50%



HOW IT WORKS. Dirty oil enters inlet (1) at left, fills housing (2) and flows through metal edge-type filter. (3) Clean oil rises through center of filter, leaves at right. Dirt combed out by cleaner blades (4) is removed through drain (5).

Here's what the U.S. Army has done to test Cuno's new 40-micron SUPER Auto-Klean filter for their engines:

They ran destruction tests on several identical engines equipped with different brands of filters. As they ran, dust was introduced into the air intakes. When compression fell to half its initial value, the test was stopped. Best life for engines equipped with cartridge-type filters was 60 hours.

The engine with SUPER Auto-Klean ran 90 hours—50% longer—and compression was still above half its initial value!

You can get SUPER Auto-Klean now!

Just specify that the manufacturer equip your new diesel with this latest and best in filtration—both for fuel and full-flow lube. You'll get longer engine life and . . .

1. Full-Flow 40-micron filtration with a self-cleaning filter. No cartridge changes; filter can't rupture or channel.

2. Low pressure drop. An 8- by 2½-inch filter element handles 30 gpm of 200 SSU lube oil with only 3 psi pressure drop. You get high capacity in a small package.

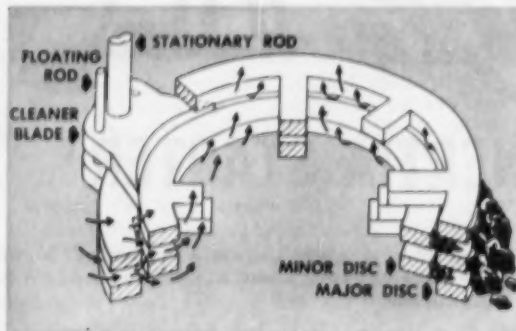
3. All metal. Can't absorb or adsorb additives from oil.

4. No interruptions for cleaning. Handles full flow all the time.

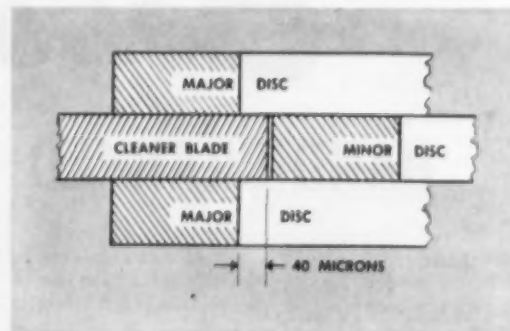
5. Standard Auto-Klean housing. On existing engines you can easily replace most 2½ in. diameter cartridges with SUPER Auto-Klean or simply install SUPER Auto-Klean in the full-flow lube line following the discharge of the engine pump.

Write today for complete technical data on the new SUPER Auto-Klean for your new or existing diesel. Ask for Catalog No. SAK-057. Cuno Engineering Corporation, 10-2 South Vine Street, Meriden, Connecticut.

8.5



FILTER ELEMENT consists of stacked major and minor discs and cleaner blade bearing against precision ground minor disc. Oil flow is shown by arrows.



LARGE PARTICLES (over 0.012 in.) are stopped at space between major discs. Short 40-micron restriction stops 40-micron particles, but allows high flow rate.



ENGINEERED FILTRATION

Removes More Sizes of Solids From More Kinds of Fluids

AUTO-KLEAN (edge-type) • MICRO-KLEAN (fibre cartridge) • FLO-KLEAN (wire-wound) • PORO-KLEAN (porous metal)

COOL SWEEP!



HARRISON COOLERS SPECIFIED FOR NAVY MINE SWEEPER!

From stem to stern . . . Harrison holds the heat! Twenty-three Harrison coolers are at work on this Navy mine sweeper. These heat exchangers are rugged, reliable . . . designed to save space, weight and money, too! That's why Harrison gets the call for cooling . . . on land, in the air . . . or at sea! And Harrison's engineering and research departments never stop searching for new ways to do the cooling job faster, more efficiently, more economically.

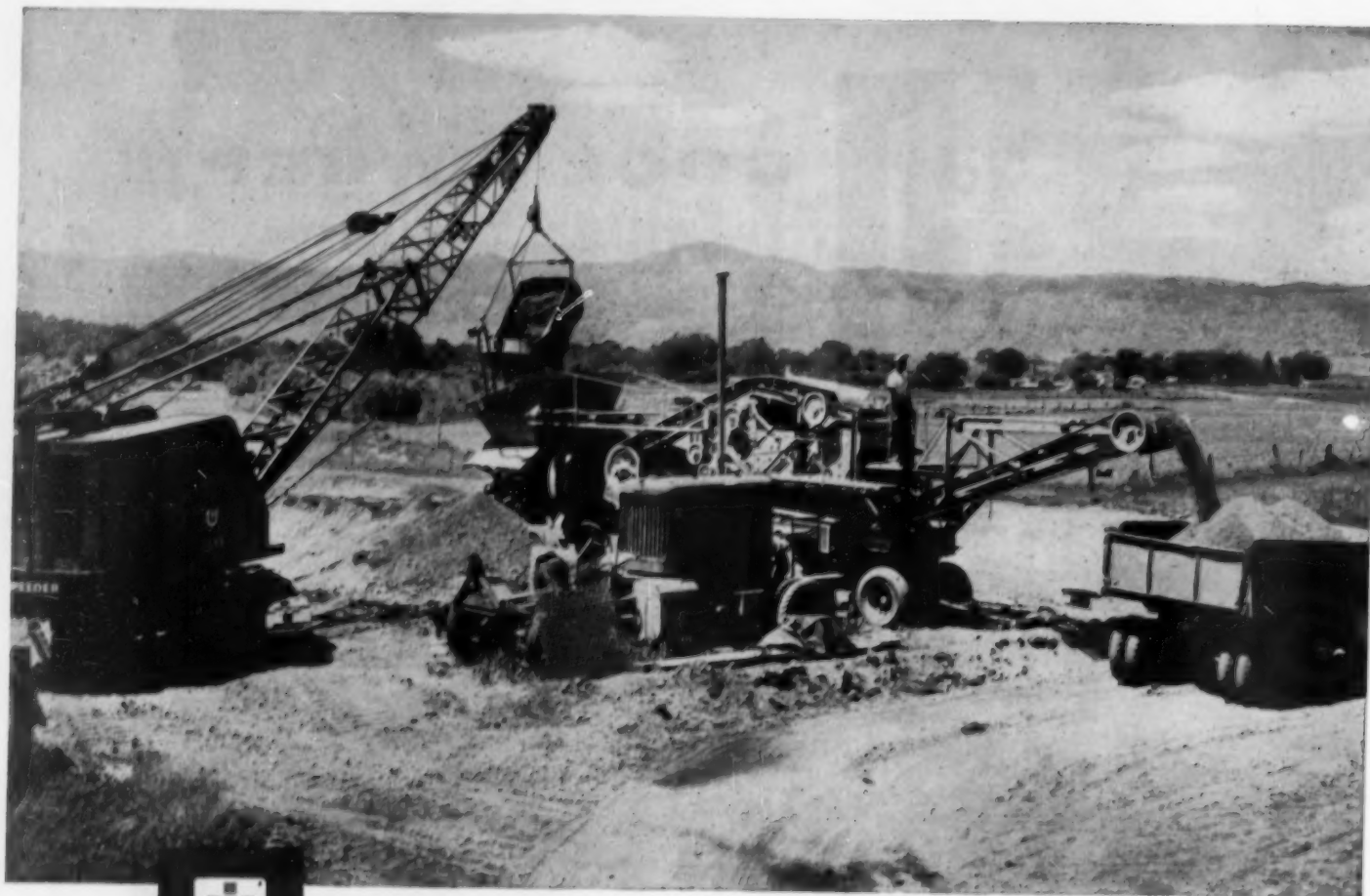
If you have a cooling problem, look to Harrison for the answer.

HARRISON RADIATOR DIVISION, GENERAL MOTORS CORP., LOCKPORT, N.Y.



HARRISON

TEMPERATURES
MADE
TO
ORDER



Widely used as original power, International diesels are available in a wide variety of sizes and modifications. Two IH diesels are used here . . . 115 hp unit in 1¼-yd dragline, 190 hp unit in 200-ton-per-hour crusher.

only

INTERNATIONAL

builds all these major advantages into diesel engines

1. Full-flow lube oil filters lengthen engine life

New replaceable plastic impregnated full-flow filters increase engine life by removing all harmful particles from the oil before it goes under full pressure to engine bearings. Exceptionally large filter area extends filter change period to 500 hours under normal conditions.

2. New injection pump reduces maintenance

Time proven International single and twin plunger pumps have been further simplified for longer life and lower cost maintenance. Scavenging gears and pump air pipe are eliminated . . . hardness of injection plunger increased for up to four times longer life.

3. Drilled passages assure full-time lubrication

You can be sure *all* engine bearings will be lubricated at *all* times. Lube oil is pressure-pumped through internal rifle-drilled passages that can't rupture or work loose.

4. Clean combustion on low-cost fuel

Trouble-free single orifice injection nozzles, and pre-combustion chambers mounted at 45° angle thoroughly mix fuel and air under all load and speed conditions. You get follow-through power strokes, clear exhaust, smooth idling on low-cost No. 2 fuel.

5. Fast, sure starting . . . always

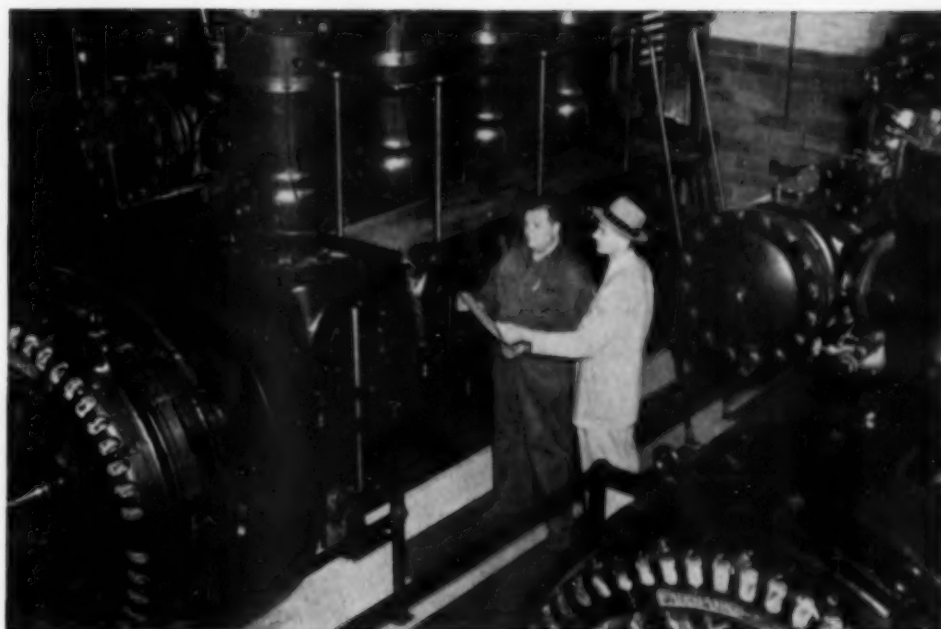
Never mind cold—IH diesels work year 'round, even in the Arctic. Seconds-fast, they start in any weather on gasoline . . . and, seconds-fast, you switch to clean-burning, full-diesel power.

Six sizes of diesels, 52 to 190 hp, complete with radiator and fan. Also 12 models, 16½ to 200 hp, for gasoline, natural gas or LPG. See your nearest International Distributor for details.



**INTERNATIONAL
INDUSTRIAL POWER**

Melvin Nissen (left) plant superintendent Graettinger, Iowa, and Standard Oil lubrication specialist R. R. Spargo inspect maintenance records. Assisting customers with lubrication problems is something for which Bob Spargo is well qualified. He is a mechanical engineer with a degree from Iowa State College and a graduate of the Standard Oil Sales Engineering School. Bob has been providing lubrication technical assistance to Standard customers for nearly nine years. Customers find his experience and training pay off for them.



How STANDARD D&G Oil helped lick five problems in one plant

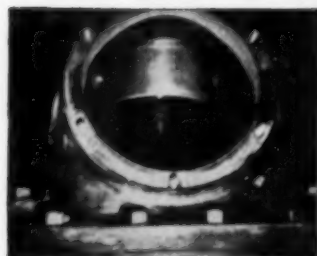
Excessive deposits, excessive maintenance, high oil consumption, were among problems solved by change-over to STANDARD D&G Oil at Graettinger, Iowa, Municipal Light Plant

Three years ago the Graettinger Municipal Light Plant began using STANDARD D&G Oil. Prior to this change-over, good engine performance was hampered by:

1. Excessive carbon deposits
2. Excessive port carbon
3. Stack fires
4. Ring sticking
5. High oil consumption

The plant averages 4.3 million HP hours of operation annually. Before changing to STANDARD D&G Oil, ports had to be cleaned several times a year. Now, with STANDARD D&G Oil in the engines, ports aren't touched between annual overhauls. Ring sticking and piston and cylinder deposits are virtually eliminated. All of this has been accomplished while continuing the use of low cetane, low gravity fuel.

Good management, careful maintenance and STANDARD D&G Oil have teamed to deliver this performance at Graettinger. Maybe you would like to use STANDARD D&G Oil to obtain similar performance from your engines. A Standard Oil lubrication specialist is nearby in any of the 15 Midwest and Rocky Mountain states ready to show you. Call him. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



Piston of one of F-M engines at Graettinger Light Plant. STANDARD D&G Oil has kept maintenance down, cut piston and liner wear.



Standard man Bob Spargo (left) and plant superintendent Melvin Nissen inspect piston through crankcase inspection plate hole. With STANDARD D&G Oil, light plant has cut oil consumption in half.

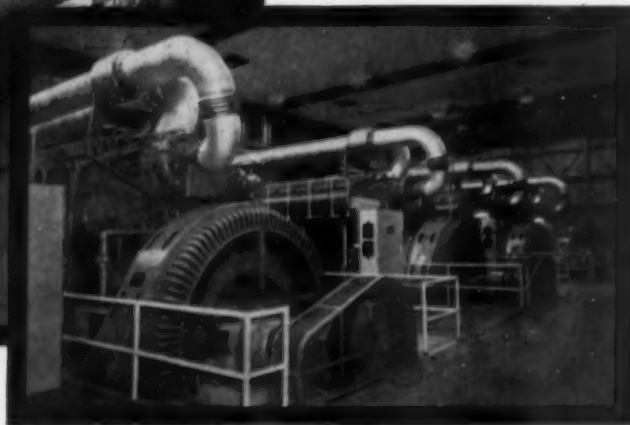
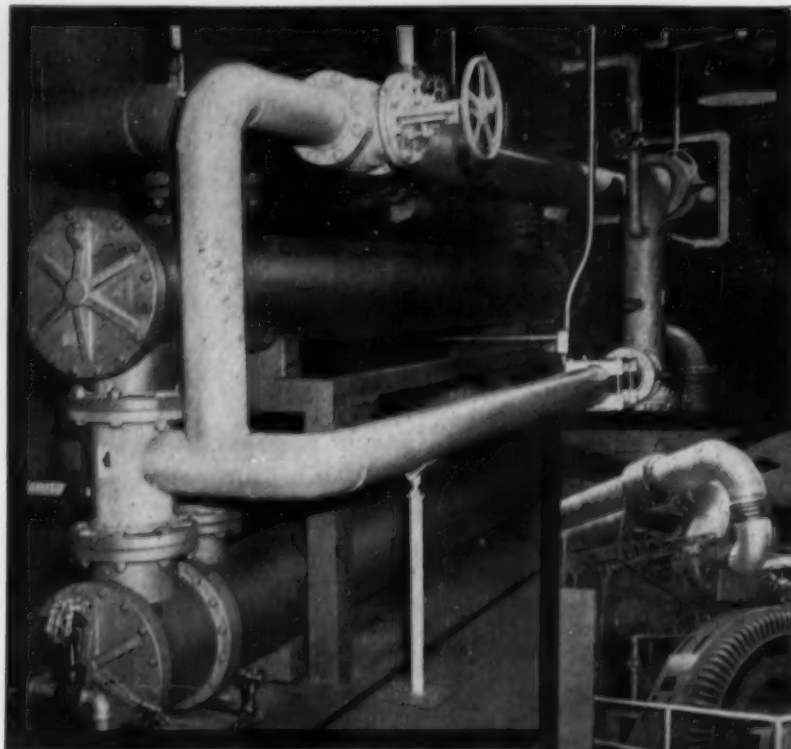
Quick facts about STANDARD D&G OIL

- 1 Made from highest-quality solvent-refined stock.
- 2 Contains additives which impart superior detergent-dispersant and anti-corrosion properties.
- 3 Anti-foaming.
- 4 Oxidation resistant.
- 5 Recommended for use (1) with economy fuels, (2) in extreme-load and/or low temperature service.



**STANDARD OIL
COMPANY**
(Indiana)

ROSS EXCHANGERS on winning team with Cooper-Bessemer Engines in REA plant contest



Recent winner of the Efficiency Award for "the nation's best operated internal combustion REA plant of the year," the M & A Electric Power Cooperative at Poplar Bluff, Mo., rode to victory with a top flight combination of Cooper-Bessemer Engines and Ross Exchangers. Its four 3300 hp Cooper-Bessemer "three-way" engines carried an overload of as much as 18 hours every weekday, month after month, to produce 58,945,000 kw/hrs.

To maintain prescribed lube oil and jacket water temperatures, two Ross Exchangers were furnished with each engine. Dependable cooling was assured from the start. So, too, was fuel oil heating: One Ross Exchanger handles this key job for all four engines.

In major power plants and industries . . . in oil fields as well as aboard harbor tugs and ocean liners, you'll find Ross Exchangers teamed with practically all types of Diesel, gas and gasoline engines.

Favored by engine builders and users alike for their extreme ruggedness and high thermal efficiency, Ross Exchangers are pre-engineered, fully standardized and promptly available in a wide range of designs and sizes.

For detailed information, request Bulletins 2.1K5 (coolers) and 1.4K1 (heaters).



ROSS HEAT EXCHANGER DIVISION

of
AMERICAN - STANDARD

1425 WEST AVE. • BUFFALO 13, N. Y.

In Canada: Kawano-Ross of Canada Limited, Toronto 5, Ont.

ADC* REPORT



LOUISVILLE TRANSIT COMPANY, LOUISVILLE, KENTUCKY

adopts Shell ADC Oilprint Analysis as major oil change yardstick . . .

uses it for faster, surer Preventive Maintenance

LOUISVILLE TRANSIT COMPANY, noted for its preventive maintenance record, has adopted the ADC Oilprint Analysis. Result: reduced PM time and outstanding economy in labor and parts.

The ADC Oilprint Analysis enables fleet operators to test the condition of crankcase oil in the short time allotted for re-fueling and crankcase

oil checks . . . a dependable evaluation in *minutes*. It answers the question "When do I change my oil?", thus eliminating the draining of usable oil and the risk of using oils loaded with contaminants.

ADC Oilprint Analysis can take an active part in your PM program. Let us demonstrate how it can effect savings for your engines. *Trademark

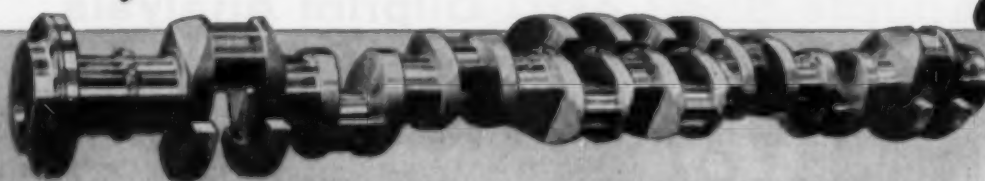
SHELL OIL COMPANY

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100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA**





Will depend on **TOMORROW'S DIESELS**
ERIE FORGE CRANKSHAFTS

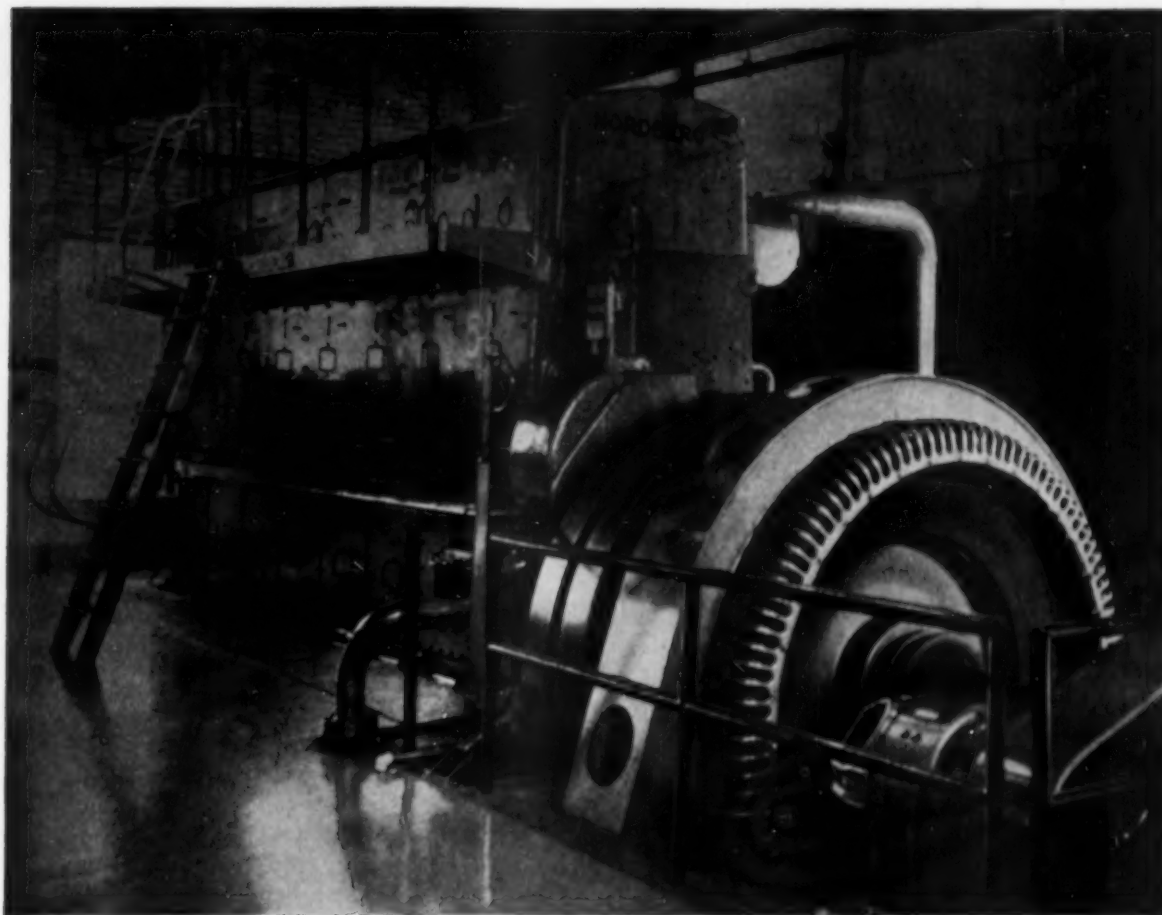


PRECISELY machined Erie Forge Crankshafts have, for many years, been synonymous with highest quality workmanship. At Erie Forge & Steel Corporation every step in production—from ingot to finished crankshaft, is under one control, one supervision. Every operation falls under closest scrutiny, thus assuring perfection in material specification, forging, machining and finishing. Today's diesels for industry, ships and locomotives depend on Erie Forge Crankshafts. Diesel engines of tomorrow will, too, because Erie Forge & Steel Corporation produces the finest forging you can buy.



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 ERIE, PENNSYLVANIA





After 30,000 hours Koppers Piston Rings still maintain "excellent" compression

At the Neodesha Municipal Power Plant, Neodesha, Kansas, Koppers Piston Rings are an important part of the 1750 bhp. Nordberg Dualfuel Engine illustrated above. After 30,000 hours of operation the pistons on this engine have never been pulled, and compression is still excellent. It is interesting to note that this Nordberg Engine, equipped with Koppers Piston Rings, has been in operation over 98% of the time—and carries

about 90% of the plant load.

Koppers has widely experienced engineers and extensive manufacturing facilities which combined can fill the most difficult of piston ring requirements. Next time you are concerned with piston rings or sealing rings, whether in replacement or new installations—in engines large or small—call on Koppers. Never any obligation, of course. For more information, mail coupon.



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The two millionth BOSCH Injection Pump has just come off the production lines. This jubilee is a striking demonstration of uninterrupted successful performance by a product ranking high among BOSCH's pioneering achievements. Only the creation of this pump made the quantity production of high-speed diesels practical at all. But the figure of two million BOSCH Injection Pumps is also the proud balance of a mass production involving more than 50,000,000 high-precision components. Together with the universally approved BOSCH diesel equipment such as nozzles, nozzle holders and filters, they are a visible expression of the proverbial

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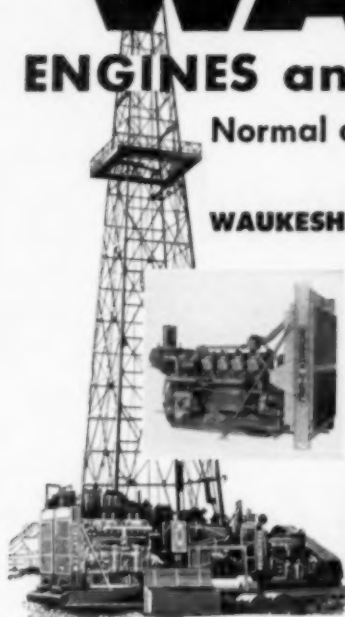
EPA 155

WAUKESHA

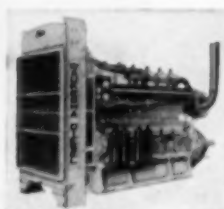
ENGINES and POWER UNITS—10 hp.-1135 hp.

Normal and Turbocharged Diesels, Gasoline, Natural Gas, LPG ...
Standard or Counterbalanced Crankshafts

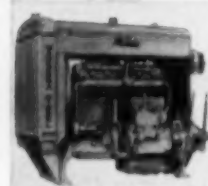
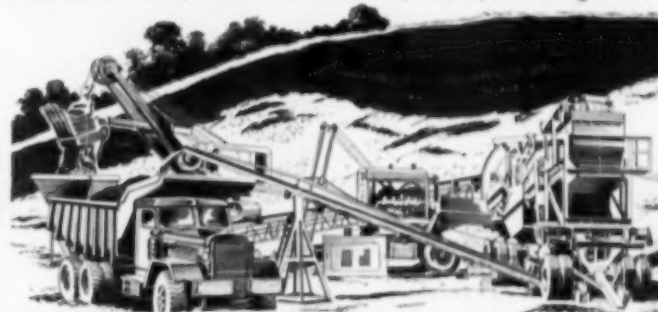
WAUKESHA MOTOR COMPANY, Waukesha, Wis. • New York, Tulsa, Los Angeles



Model VLRDBS



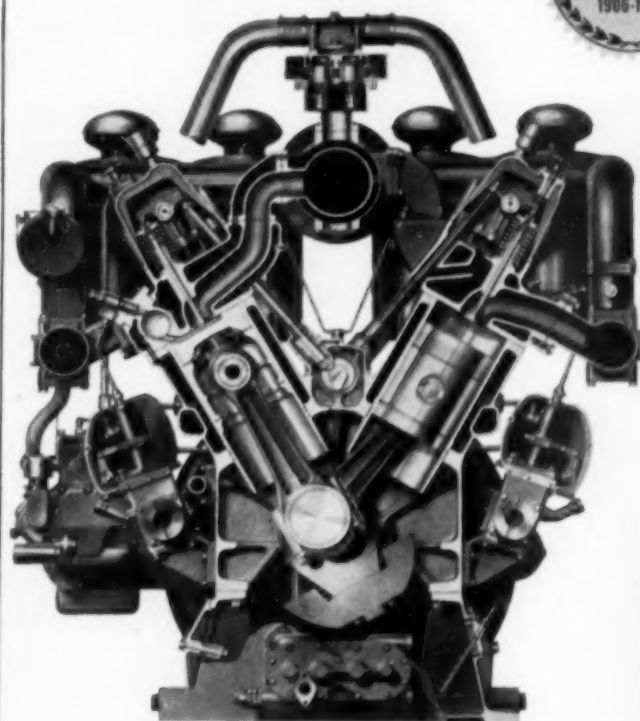
Model LRDBS



Model 148-DK



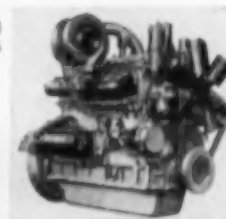
Model WAKDBS



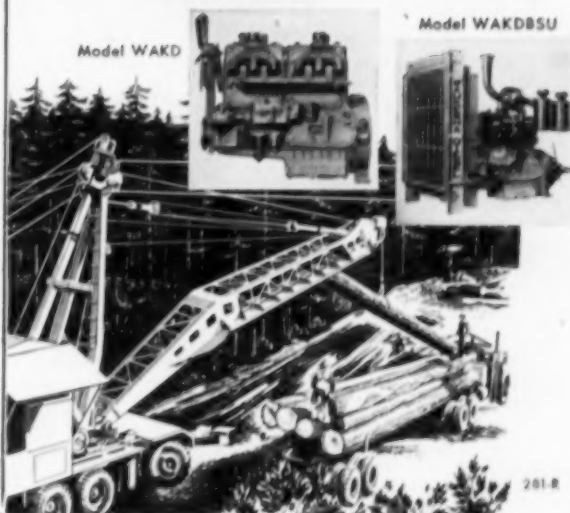
Model VLRDB NORMAL DIESEL
12-cylinders, 5788 cu. in., 830 hp
— up to 1135 hp turbocharged



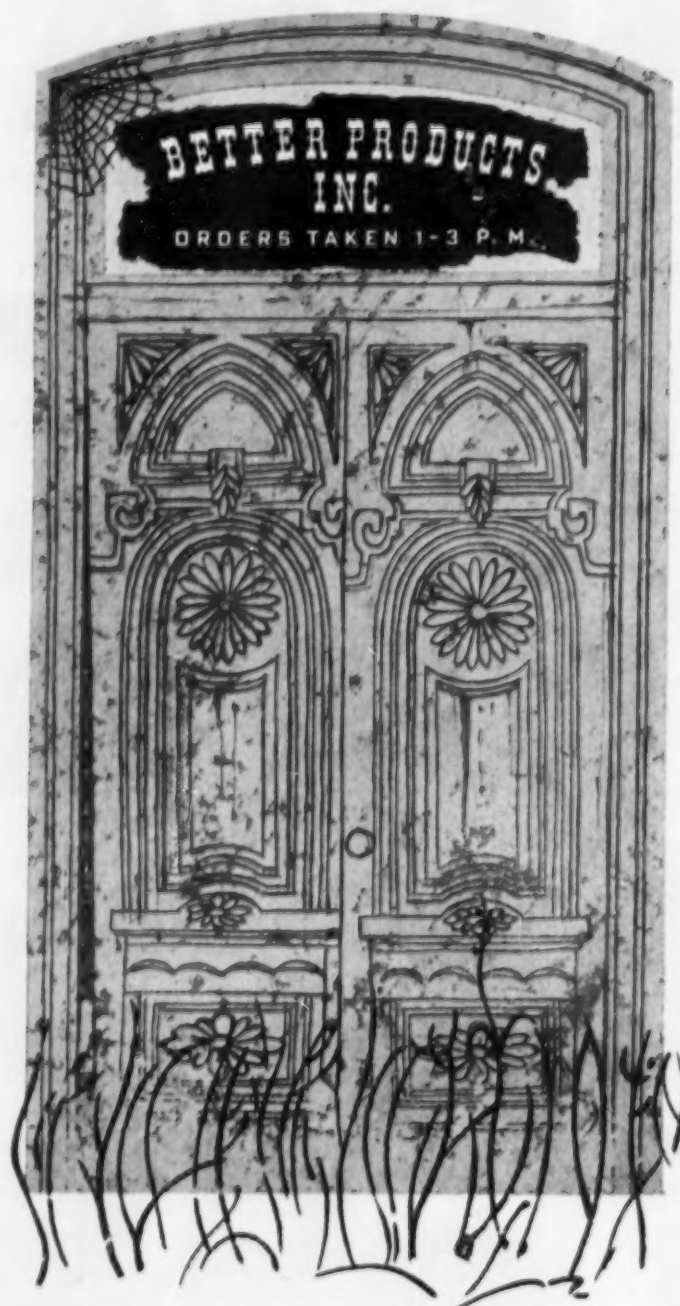
Model
135-DKBS



Model WAKDBSU



Model WAKD



what happened to the world?

What went wrong? Had a fine new product. Just what the world needed. Now sit back and watch the world beat a path to the door.

But it never did. Truth is, the world never heard of the outfit. Or its fine new product. Couldn't have cared less.

Advertising would have made the difference in this case. (Although it doesn't help a product that isn't basically sound.) Advertising spreads the word to the trade and public. Lets them know who you are. What you're offering. What it will do. What it costs.

Advertising whets interest and opens doors for salesmen. It creates demand.

And it does more. For when it helps you sell, it helps you provide jobs. And when it creates mass markets, it helps you bring down prices. It raises everybody's standard of living, which in turn, creates more buying power. It's a victorious circle.

As a businessman, you already know advertising helps you sell. But you're a consumer, too. And —

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- selection of type of element
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filtration, flow rate, contamination to be removed, viscosity of fluid, plus a complete glossary of terms that apply to filtration. Printing of this manual is limited so please send in coupon for your copy today.

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GULF DIESELMOTIVE OIL begins the second decade of dependable service in the P. F. Martin fleet

(McAllister Brothers' Philadelphia Affiliate)

The oil that lubricates the powerful engines of these hard working tugs has to insure dependable and economical operation in a daily routine performed during severe weather conditions, heavy traffic, and changing tides.

Gulf Dieselmotive has consistently proven that it has the quality to stand up and provide effective protection in this tough service. It has contributed greatly to the outstanding operating and maintenance records for all P. F. Martin tugs over the past 10 years—and it is ready to start the second decade.

Gulf Dieselmotive Oil ranks very high with marine operators for several reasons:

1. Chosen for their ability to prevent hard carbon deposits in hot spots, the selected base stocks of Dieselmotive Oil also provide an oxidation resistance safety factor.

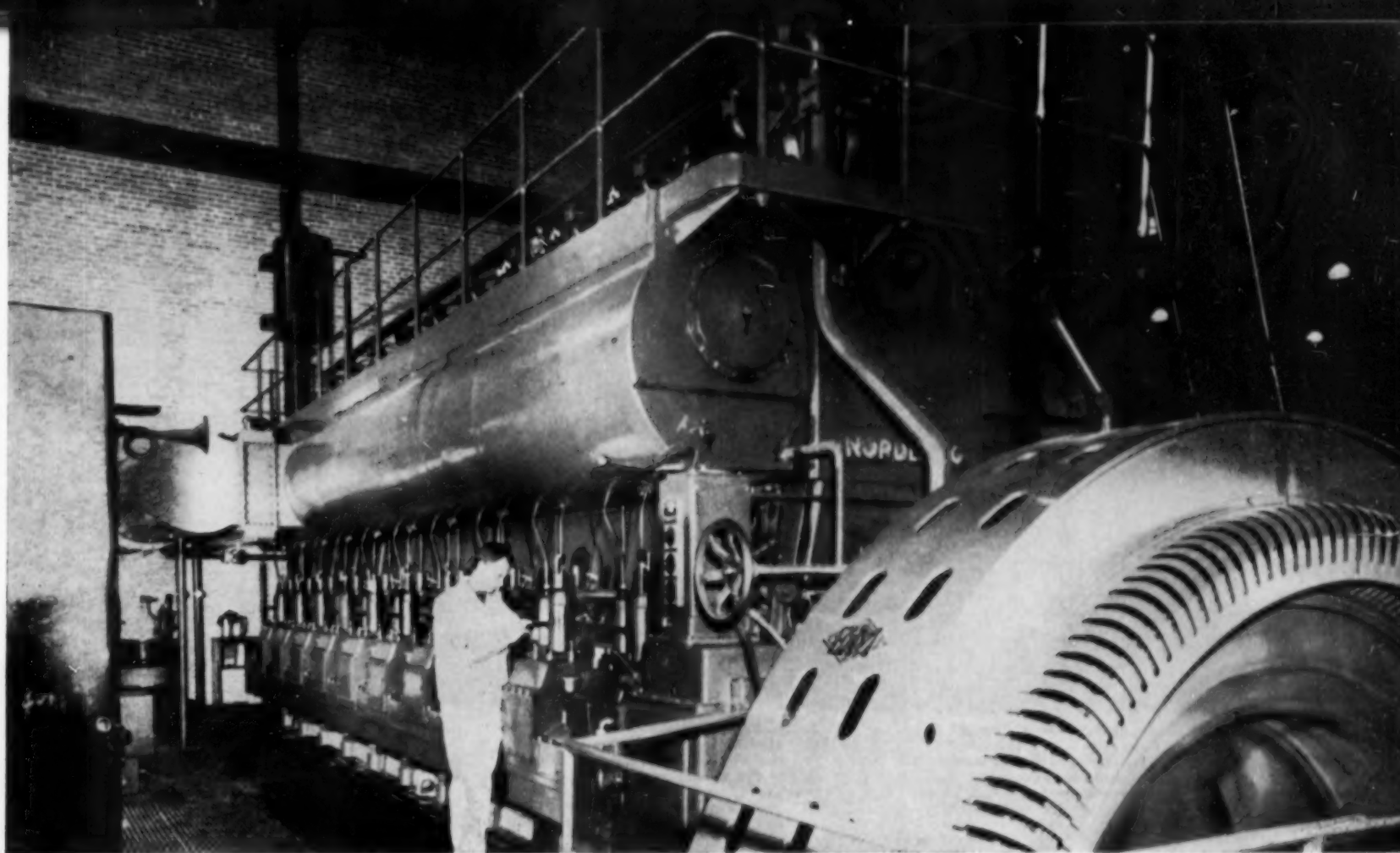
2. 100% solvent refining of base stocks (which removes undesirable constituents) guarantees greater stability and more effective bearing protection.

3. Superior additive response is obtained by carefully matching the additives to the base stocks. This insures clean rings, grooves, oil cooling passages, and a minimum of piston crown deposits.

This combination of Dieselmotive qualities makes possible more hours of operation between ring jobs, and lower maintenance costs. Ask a Gulf Sales Engineer—experienced in Diesel engine operation—to recommend the proper grade of this outstanding lubricating oil for your Diesels. Consult the telephone directory for the number of your nearest Gulf office.

THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS





Operator Lee Pippin checks one of the American-Bosch oil injection pumps on the 4800 hp Nordberg Dualfuel engine in the Garland, Texas, generating plant. Also shown are the Electric Machinery 3500 kw generator, Woodward governor and Manzel cylinder lubricators.

GARLAND, TEXAS

By DWIGHT ROBISON

THE municipal power plant at Garland, Texas has succeeded in combining feverish expansion with record-high operating economy and efficiency. In a period of less than two years, the plant more than tripled its kilowatt capacity by adding two Nordberg 21 in. bore Dualfuel engines, rated 3010 hp and 4800 hp, respectively. Coinciding with this rapid expansion, fuel costs at the plant have been reduced to an average of 2.22 mills per kilowatt hour, lowest in the plant's history, and net profits after all departmental expenses, including distribution and contributions to the General Fund, have jumped more than 123 per cent, from \$96,973.36 in fiscal 1951-1952, to \$216,633.67 in fiscal 1953-1954.

Garland, located about 14 miles northeast of Dallas, has become the center of intense postwar industrial and residential development. Since 1940, its incorporated land area has been expanded from one square mile to 10.7 square miles. In the same period, its population has jumped more than ten-fold, from 2,223 in 1940 to a present total of more than 24,500; its assessed valuation has skyrocketed from \$1,100,000 to over \$18,700,000; and its consumption of power has increased more than 30-fold,

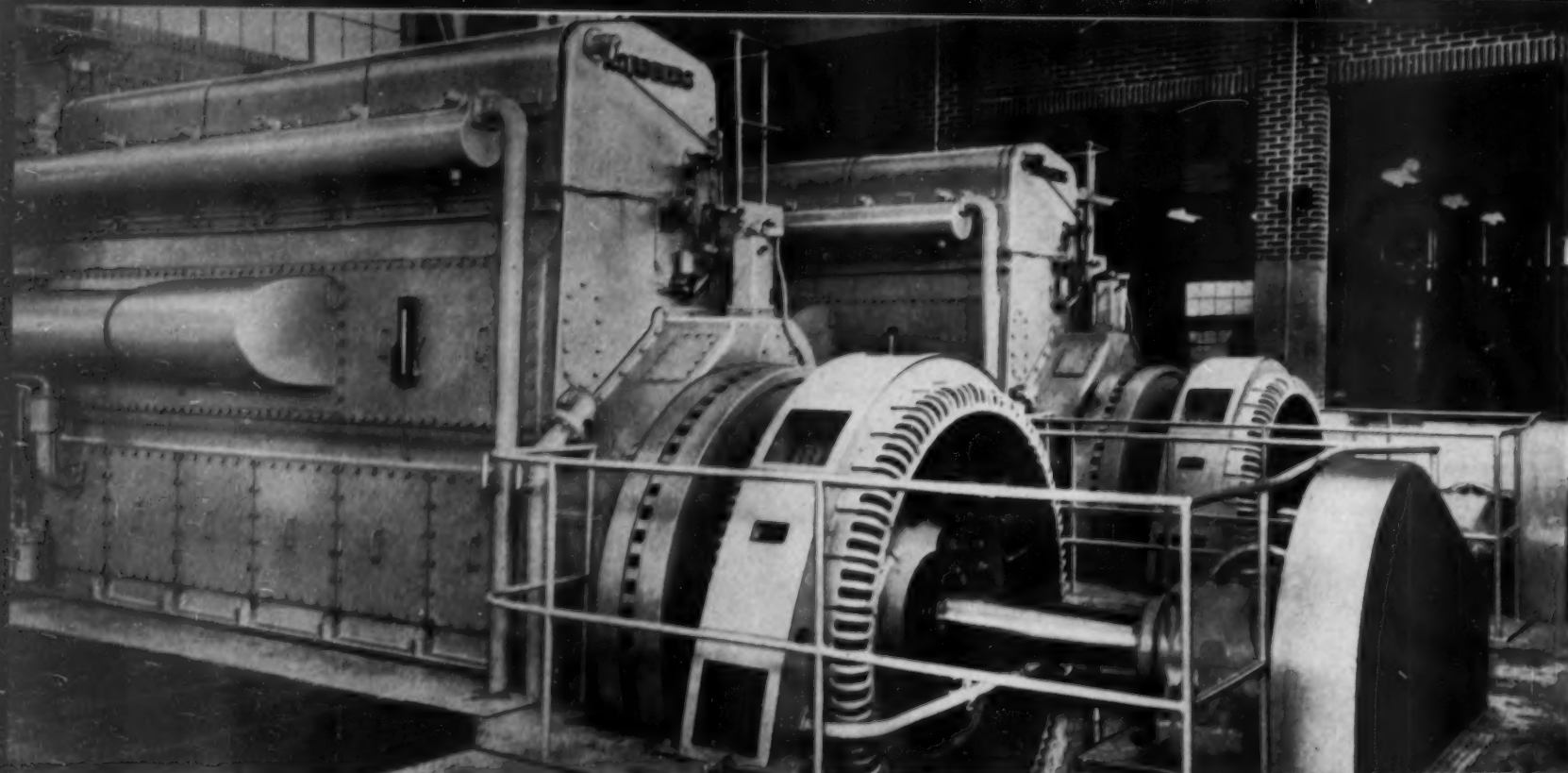
from 1,375,000 kwhs in 1940 to 41,500,000 last year. Of this 1954 total, approximately 13,000,000 kwhs were purchased. At this writing, 45 industries have located at Garland, most since 1948. In the three boom years of 1951, 1952 and 1953, a total of 2,074 new homes were built within the city limits. In the last five years, the number of connected consumers served by the city's Electric Department has increased more than 45 per cent, from 3460 in 1950 to 5449 in 1954.

This feverish expansion has permanently altered Garland's agrarian economy but agriculture still remains the basic money maker. The surrounding area is ideal for cattle raising and rich harvests of cotton, corn, wheat, oats and maize are brought in each year. The load at Garland's municipal power plant has risen with the increase in industrial activity and population growth—with a big assist from home, office and industrial air conditioning. In 1950, the plant's total peak load, including purchased power, was 4380 kilowatts. In 1954, five years later, the peak reached 9702 kw, an increase of more than 1,000 kw per year or 121 per cent. Before the end of 1955, peaks are expected to top 10,000 kw. To help meet this increased

demand, the power plant has constructed two additions to its original building and has installed four Nordberg Dualfuel engines since 1949. The first two engines installed, a pair of 6 cylinder, 16 in. x 22 in., supercharged, four-cycle engines, rated 1220 hp at 327 rpm, went into operation in January, 1949. Housed in the first of the two new building additions, they more than doubled the plant's production capacity, increasing it from 1166 kw to 2876 kw. Peak loads continued to increase at a rate of 1,000 kw or more per year, however, and in January, 1953, and October, 1954, two 2-cycle, 21½ in. x 31 in. Nordberg Dualfuel engines were installed, more than tripling the plant's capacity, from 2876 kw to 8686 kw. The first of the two units is a 7 cylinder engine, rated 3010 hp at 225 rpm and driving a 2860 kva, 2310 kw generator.

The newest is a 10 cylinder unit, rated 4800 hp at 240 rpm and driving a 4375 kva, 3500 kw generator. Almost immediately, these two engines became the plant's base load units.

Operating efficiency and economy were never lost sight of during this period of rapid expansion. The pressure of acquiring new engines was not



The Garland plant's two 1220 hp 327, rpm Nordberg supercharged Dualfuel engines, installed in January, 1949. These 4-cycle units each drive an 855 kw Elliott generator with V-belted 15 kw GE exciter. The Marquette governors are also visible.

Installed within a few feet of the 4800 hp Nordberg control station is this oversize gauge board. In addition to duplex and simplex Loneragan pressure gauges, it includes an Alnor exhaust pyrometer, GE meters and visual and audible pressure and temperature alarms.



allowed to detract from the municipal power plant's basic goal of providing dependable power in sufficient quantity at the lowest possible cost.

In 1947, prior to the installation of the Nordberg engines, three original straight diesel engines generated a total of 1,023,800 kw-hrs while consuming 81,807 gals. of fuel at an average rate of 12.51 kw-hrs per gallon. At today's delivered price of 8.66¢ per gallon for fuel oil, this represents an average fuel cost for the 12-month period of 6.92 mills per kw-hr. Since the installation of the four new Nordberg Dualfuel engines, which regularly carry more than 95 per cent of the plant's total load, these fuel costs have been cut more than 67 per cent. During the 12-month period ending on April 30, 1955, the Garland plant generated 30,282,930 kw-hrs, of which all but 44,410 kw-hrs were generated by the five dual fuel engines, including one of the original diesel engines which was converted to dual fuel in 1952. In this same period, a total of 284,093 mcf of natural gas was consumed, at a cost of \$46,869.94; and a total of 225,947 gals. of pilot oil and 4,533 gals. of fuel oil was consumed at a combined cost of \$20,032.74. This represents an average fuel cost for the entire plant of 2.22 mills per kilowatt hour.

In terms of thermal efficiency, the improvement in operation introduced by the four Nordberg Dualfuel engines is equally impressive. The diesel oil used at the Garland plant averages seven pounds per gallon and 19,360 Btu per lb. The natural gas used averages 915 Btu per cubic foot. In 1947, by consuming 81,807 gals. of fuel oil and producing 1,023,800 kw-hrs, the three older engines averaged 10,828 Btu kw-hr. In the 12-month period ending April 30, 1955, the four Nordberg Dualfuel engines

and the converted engine averaged a low 9,609 Btu kw-hr, an improvement of 11 per cent. This is based on a consumption of 284,093 mcf of natural gas at a rate of 9.38 cu. ft./kw-hr and 225,947 gals. of pilot oil at a rate of .0074 gals./kw-hr. Dual fuel production for this period was 30,238,520 kw-hrs.

Net profits, effected by increased plant economy, also took a sharp rise. In fiscal 1951-1952 the plant generated a total of 13,751,748 kw-hrs and purchased an additional 11,507,751 kw-hrs. The total cost of operating the Electric Department, including \$100,517.61 for purchased power and including all administration expenses, contributions to the city's general fund, distribution, and all power plant costs except depreciation, was \$270,737.26. Gross revenue that year was \$402,395.49 and net profits, after depreciation, were \$96,973.36. In fiscal 1953-1954, meanwhile, the plant generated a total of 26,348,960 kw-hrs and purchased 14,626,947 kw-hrs in addition. The cost of purchased power during this period was higher, averaging 9.51 mills per kw-hr compared to 8.73 mills in fiscal 1951-1952. Despite this increase, net profits jumped 123 per cent over the previous period. The total cost of operating the Electric Department, including \$139,126.33 for purchased power, and including all expenses listed above, was \$398,116.14. With gross revenue at \$668,935.99, net profits after depreciation were at an all-time high of \$216,633.67.

The Garland plant dates back to April 1, 1922, when a 75 hp diesel was installed to provide standby power for the city's water supply pumps. At the outbreak of World War II, the Garland power plant had three diesel engines on the line. The three engines in service totaled only 1166 kw in capacity and it became necessary to purchase

large amounts of power from a nearby utility to meet the wartime demand. With the end of the war, however, the availability of new diesel equipment, plus the availability of natural gas once again turned the City's attention towards expansion of the municipal power plant. In 1949, the first two Nordberg Dualfuel engines were installed, 6 cylinders, 16 in. x 22 in., supercharged units direct-connected to 1069 kva, 855 kw, 4160/2400 volt, 3-phase, 60 cycle generators, with V-belted 15 kw exciters. In August, 1952, the 875 hp engine was converted to dual fuel and on January 1, 1953, the city installed its third Nordberg engine, a 7 cylinder, 3010 hp Dualfuel unit driving a 2890 kva, 2310 kw, 4160 volt, 3-phase, 60 cycle generator with V-belted 30 kw exciter. Total peak load that year, including the demand placed on the nearby utility was 7955 kw. In the next 12 months this peak jumped almost 1800 kw to 9702 kw. In October, 1954, the Garland plant added its fourth Nordberg Dualfuel engine within five years, bringing plant capacity up to 8686 kw. By far the largest of the seven engines now in service, it is a 10 cylinder, 4800 hp unit driving a 4375 kva, 3500 kw, 4160 volt, 3-phase, 60 cycle generator, V-belted to a 40 kw exciter.

Pilot oil for the four Nordberg Dualfuel engines

is stored in two underground tanks, one of concrete construction with 15,000 gal. capacity and one of steel construction with 12,000 gal. capacity. A new 12,000 gal. steel tank is being constructed above ground to replace the steel tank now underground. For the two 1220 hp engines, the day tanks are located in the plant's basement and fuel is sent to the cylinders through duplex filters by engine-driven supply pumps. For the 3010 hp and 4800 hp Nordberg engines, the day tanks are elevated on an interior wall and the fuel flows by gravity to the engine-driven supply pumps.

Scavenging air for the 2 cycle 4800 hp engine is supplied at a pressure of 3.31 psig by a 23,000 cfm centrifugal blower, driven at 3550 rpm by a 450 hp induction motor. Since this blower draws power from the engine's 3500 kw generator, batteries are used to force the generator's field when starting the engine. The 3010 hp Nordberg is also a 2 cycle engine and scavenging air is supplied at a pressure of 2.65 psig by a 15,120 cfm centrifugal blower,

driven at 3550 rpm by a 250 hp line-start induction motor. This blower also draws power from the unit's generator but instead of batteries, a 5 hp, 1735 rpm motor-generator set is used to force the generator's field during starting operations. Supercharged engine air for the two 4-cycle, 1220 hp engines is supplied to the cylinders by built-in, exhaust gas-driven turbines, located at the control end of each engine.

Scavenging air for the 4800 hp and 3010 hp engines is regulated according to load conditions through an automatic control system which is actuated by the temperature of the exhaust. Operators at the Garland plant report that they have dumped a load of 3000 kw on the 4800 hp engine when it was carrying only 200 kw—without ill effects. The engine picked the load up instantaneously, running as smoothly as before.

All power at the plant, including incoming purchased power, is controlled at a 10 panel switchboard. This board is equipped with oil circuit breakers, watt-hour meters, voltage regulators, ammeters, volt meters, continuous graph-type megawatt recorders, a kilowatt x 100 meter on incoming power, and a swinging synchroscope. A separate panel contains 24-hour recording meters on exhaust temperature.

With this equipment, all installed in the two building additions completed since 1949, the Garland municipal power plant has taken a long step towards self sufficiency. Sharply reduced operating costs have helped the Electric Department maintain a low rate structure, thereby promoting industrial and civic development. A large share of credit for the success of the power plant's expansion rests with the City Council and with L. E. Stark, City

Manager since 1951. Sharing this credit is C. E. Newman, Plant Superintendent, who helped found the department in 1922.

List of Equipment

Engines—(2) Nordberg four-cycle, 6 cylinder, 16 in. x 22 in., supercharged Duafuel engine, rated 1220 hp at 327 rpm and driving directly a 1069 kva, 855 kw, 4160/2400 volt, Elliott Co. generator V-belted to a 15 kw, 125 volt General Electric exciter.

(1) Nordberg two-cycle, 7 cylinder, 21½ in. x 31 in., Duafuel engine, rated 3010 hp at 225 rpm and direct-connected to a 2890 kva, 2310 kw, 4160 volt, 3-phase, 60 cycle, Elliott Co. generator V-belted to a 30 kw, 125 volt Elliott Co. exciter.

(1) Nordberg two-cycle, 10 cylinder, 21½ in. x 31 in., Duafuel engine, rated 4800 hp at 240 rpm and direct-connected to a 4375 kva, 3500 kw, 4160 volt, 3-phase, 60 cycle Electric Machinery Mfg. Co. generator V-belted to a 40 kw, 125 volt E-M exciter.

Governors—Woodward, Marquette.

Turbochargers—Elliott.

Turbo blowers—Allis-Chalmers & Elliott.

Fuel oil injection pumps—American Bosch.

Fuel oil transfer pumps—Blackmer, Height Pump.

Fuel oil meters—Buffalo Niagara.

Fuel oil filters, duplex—Nugent.

Fuel oil filters—Hilliard.

Gas meters—Roots-Connersville.

Gas regulators—Rockwell.

Lube oil—Parvis, Gulf Oil Corp.

Lube oil filters, cartridge type—Hilliard.

Lube oil filters, full-flow—Hilliard.

Lube oil circulating pumps—De Laval.

Lube oil pumps, before and after—Allis-Chalmers, Blackmer.

Cylinder lubricators—Manzel.

Lube oil coolers—Kewanee-Ross.

Turbo blower oil cooler—Kewanee-Ross.

Jacket water pumps—DeLaval, Allis-Chalmers.

Jacket water heat exchangers—Kewanee-Ross.

Automatic temperature control valves—Fulton-Sylphon.

Cooling towers—Marley.

Aquatowers—Marley.

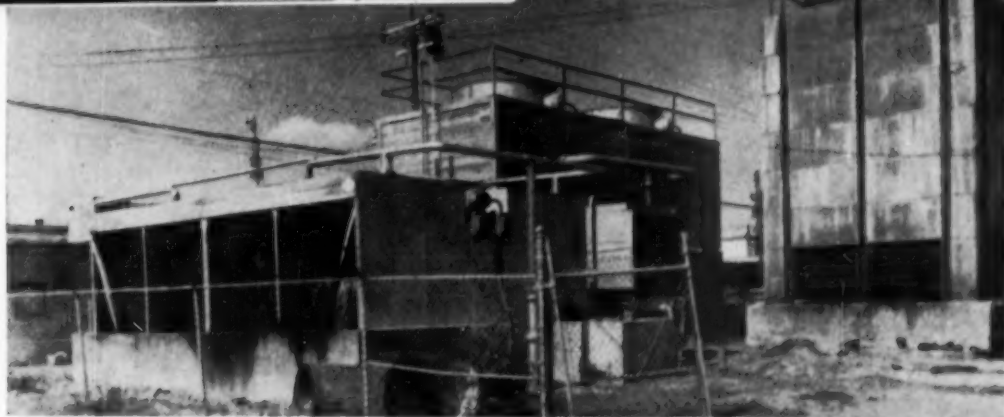
Air intake filters—American Air Filter Co.

Air Compressor—Gardner-Denver.

Exhaust pyrometers—Alnor.

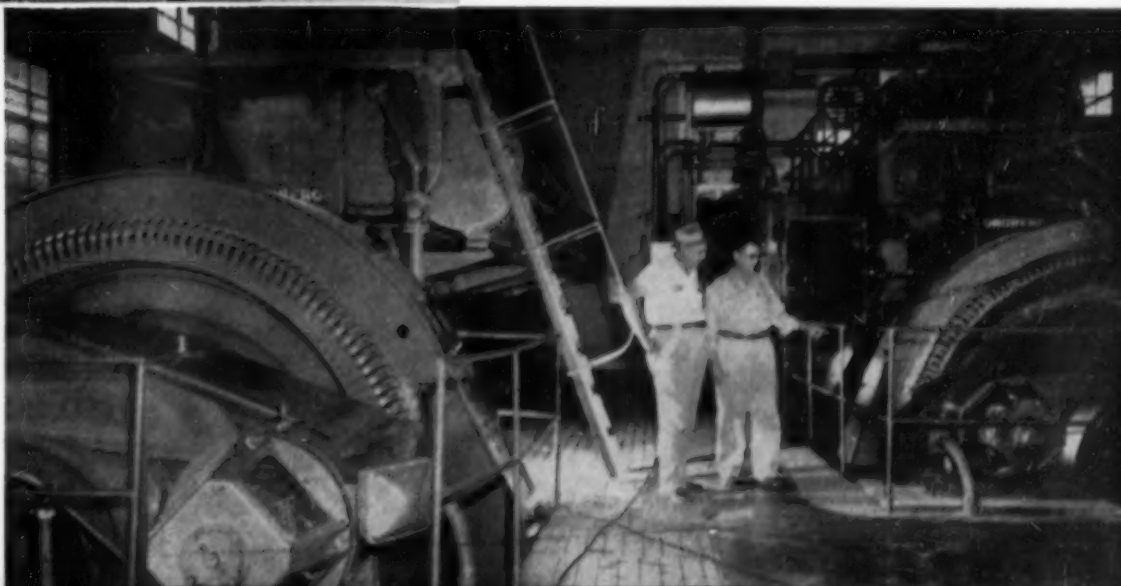
Recording exhaust meter—Minneapolis-Honeywell.

Switchboard—Westinghouse.



A carefully planned cooling system for each of the engines was necessary because of the extremely hot, dry summers. At the rear of the plant are these Marley cooling towers and aquatowers, a Briggs tower for the old straight diesels and a Marley water cooled air intake for the 3010 hp Nordberg.

City Manager L. E. Stark (left) and Plant Superintendent C. E. Newman examine the 2310 kw Elliott generator driven by the 3010 hp, 7-cyl. Nordberg. At left is the 4800 hp, 10-cyl. Duafuel engine.



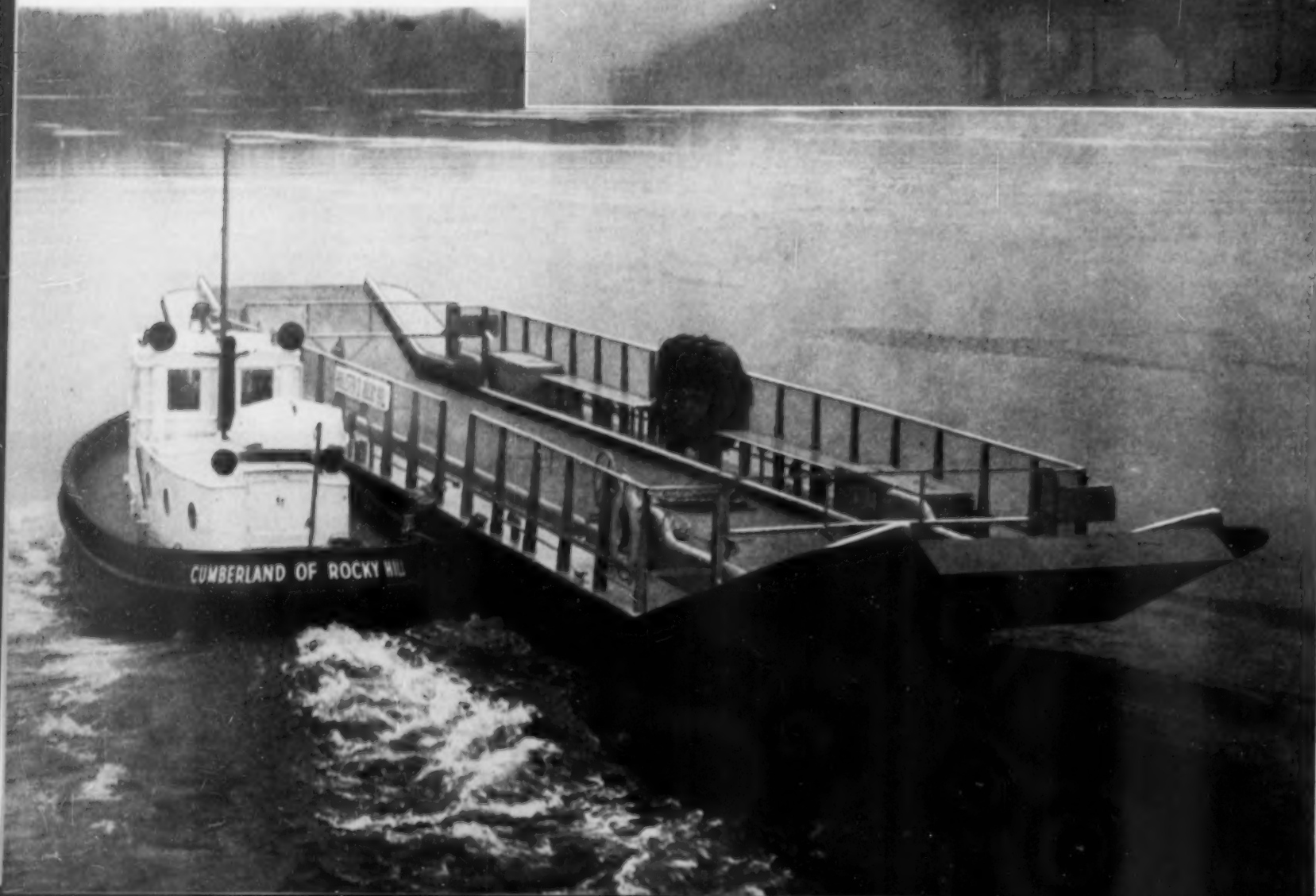
EDITOR'S NOTE

For some thirty years Arnold B. Newell was a valued executive of our esteemed contemporaries *MOTORSHIP* and *DIESEL POWER*, as such he is well known to many of our readers. Mr. Newell retired last June and we are indeed glad to tell you that he will be a regular contributor to *DIESEL PROGRESS*. His articles and comments on industry trends will be found interesting, informative and easy to read. We are glad to welcome Arnold B. Newell to our distinguished list of regular contributors.

FROM the viewpoint of functional design the little 32 ft. diesel tug *Cumberland* and the 64 ft. by 15 ft. automobile barge *Hollister III* are of interest and significance. Both were designed for the Connecticut State Highway Department by Eldridge & McInnis, well known Boston Naval architects. Construction was completed last month at the yard of Blount Marine Corporation in Warren, Rhode Island. Both units are of welded steel throughout.

The propulsion engine is a General Motors Detroit 6-71 diesel driving a 5-blade Columbian Bronze wheel of 34 in. diameter and 30 in. pitch for an 8 mph speed of boat and barge, which is something more than is needed at the Connecticut River crossing on the route connecting Glaston-

NUTMEG STATE



TE BUYS A 'PUDDLE JUMPER' by Arnold B. Newell



The Connecticut State Highway Department's diesel tug *Cumberland* and automobile barge *Hollister III*. Power is provided by a GM Model 6-71 diesel engine.

bury and Rocky Hill. This crossing is about midway between the great Charter Oak Bridge at Hartford and the comparatively new, high bridge at Middletown. Without ferry service motorists would be required to travel 15-20 miles to one of the bridges. Traffic is not enough to justify the cost of a bridge at this point.

Old equipment on the run fell apart, so to speak, last year and the motoring public started howling at the Highway Department for resumption of service, and quick. A hurry-up order was placed with Blount in August and the launching took place December 6, whereupon there broke a "tempest in a teapot." Connecticut nonchalantly remarked through publicity that this was the oldest continuous ferry service in the country, established before 1700 and the day before the launching a Providence newspaper published it. Whereupon the Newport Ferry Company set up a hue and cry to the effect that the Nutmeggers were up to their old trickery because their service started on the Jamestown run in 1675 with sail boats. Out of the Connecticut archives came the record of Glastonbury ferry operation dating to 1655. That settled it in favor of Connecticut Yankees. It gave

Luther Blount a golden opportunity to state some facts worth recording.

He announced that inexpensive equipment of this kind could be used effectively and economically to relieve traffic congestion by serving routes where the high cost of bridge construction was not a justifiable expenditure. He proceeded to make a demonstration between Broad Street and Ferry Lane in Barrington. Eldridge & McInnis designed the tug and barge hull, but the Blount organization is responsible for design of the barge ramps which are counterweighted and operated by hand, the raising or lowering time being only 10 seconds. The ramps also act as shields to prevent the barge shipping water in choppy weather and the sharp incline adds a secondary guard against an automobile rolling off the end of the flat deck. The auto capacity is three cars and the passenger capacity is 25 persons. At the point of crossing, the river is narrow and the run is a matter of two or three minutes.

It is worth recording that the tug and barge could be disposed of more readily and at a better price than a ferryboat would bring if a bridge should

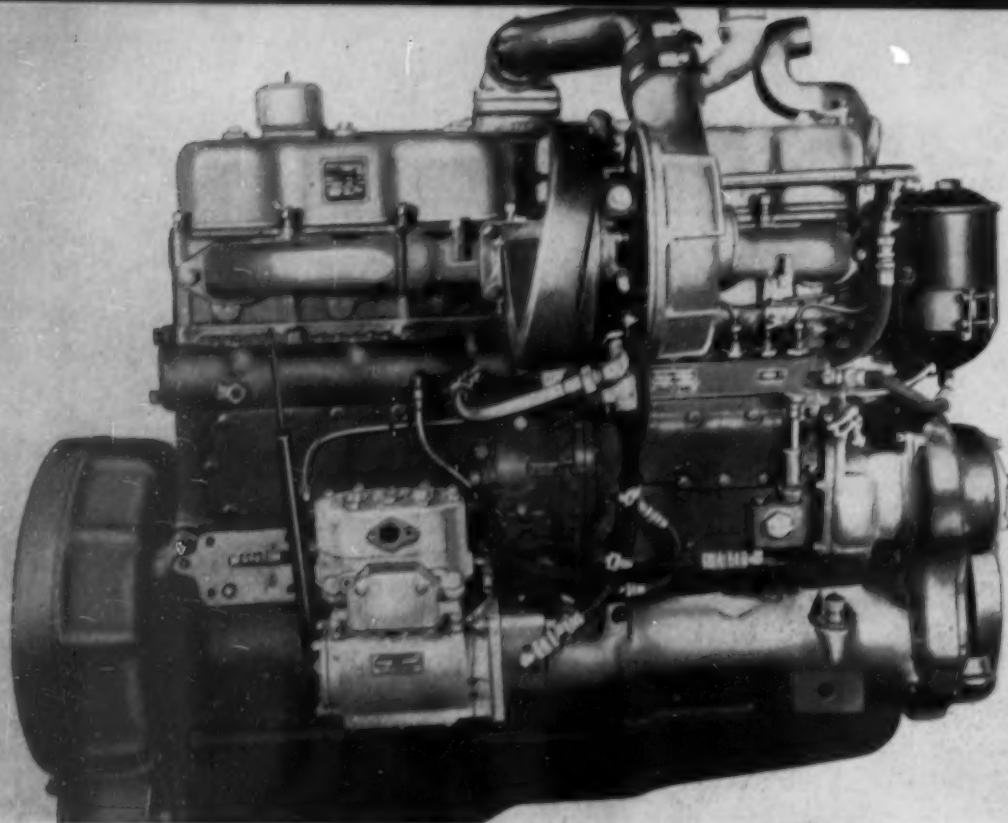
displace them. Each unit is separately useful. A distinct disadvantage is the need to confine such a combination to operation in very smooth water.

TUG PARTICULARS

Length	32 ft.
Beam	15 ft.
Hull depth	6½ ft.
Draft	4 ft.
Speed, with tow	8 mph

List of Equipment

Propulsion—6 71 G-M Detroit Diesel.
 Pilothouse control—Morse Instrument Co.
 Steering system—Columbian Bronze Corp.
 Propeller—5-blade, 30x34, Columbian Bronze.
 Bearing For same—Goodrich.
 Bilge pump—Jabsco.
 Fuel trans. pump—Blackmer.
 Barge bilge pump—Marine Products Co.
 Dinghy, fibreglass—Anchorage Plastics Corp.



Right side of the Mack Turbocharged Thermodyne diesel for truck and tractor application. It shows the low-head compact arrangement of the Schwitzer-Cummins turbocharger and the flange-mounted direct-driven injection pump and compressor.

THE MACK TURBOCHARGED DIESEL ENGINE

PRODUCED in both trucks and bus arrangement, a Mack turbocharged Thermodyne diesel of 205 horsepower is now in full production. Like its naturally-aspirated companion engine, it is produced exclusively for Mack truck, tractor and bus models. Basically the turbocharged version is identical with the naturally-aspirated type, both having piston displacement of 672 cu. in., bore and stroke being $4\frac{1}{8}$ by 6 inches, with operating speed governed at 2100 rpm. Specific fuel consumption is 0.36 lbs. bhp-hr. An unusual feature is that the compression ratio is the same in both models, so that the turbocharged type starts with equal facility.

Chief differences between the naturally-aspirated and turbocharged versions are in the injection system and, of course, in the manifolding. For the increased injection volume required by the latter, the injection pump and nozzles, both of American Bosch make, are of larger capacity than used on the naturally-aspirated type. Also the governor, likewise an American Bosch, is located on the outboard end of the pump.

Of Schwitzer-Cummins make, the turbocharger is mounted on the three-part exhaust manifold, which is on the right side of the engine, delivering the air to the intake manifold on the opposite side by a pipe passing over the top of the engine. In the truck form, the turbocharger is placed approximately on a level with the cylinder heads, while in the bus type, it is placed above them. The rotor shaft runs longitudinally of the engine. Both water cooling and lubrication of the turbocharger middle bearings are supplied from the engine, with short external connections.

Mack diesels are of the four-stroke air-swirl type, with open combustion chambers and direct injection. Air swirl is induced by directional intake porting, combined with venturi effect, such that the incoming air enters the cylinder in a tangential direction. Valves are not masked and are thus not only free to turn; but are positively constrained to do so by valve rotators. Added to the swirl, there is a pronounced squish of air at the top of the compression stroke, which augments the initial motion of the air. This is the result of the compact combustion chamber, recessed in the crown of the piston, about which there is a large flat area with minimum clearance under the flat

cylinder head. The combustion chamber is of semi-toroidal or "Mexican hat" form.

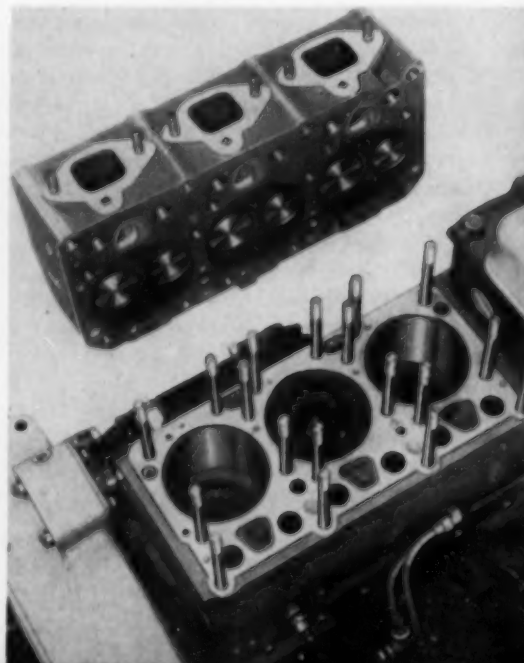
Due to the rapid swirling of the air in the combustion chamber at the moment of injection, rapid and intimate dispersal of the fuel takes place without the necessity of high injection pressure. Consequently the multiple-unit injection system, with hydraulically-operated nozzles is used. Nozzles are inclined in the heads, so that though their tips are approximately at the centers of the combustion chambers, they extend through the sides of the heads, outside the valve-rocker chambers and thus involve only the simplest of piping. Their inclined position moreover leaves ample water space between the valves and provides adequate cooling for the nozzles themselves. They have unusually long shanks for effective cooling and are retained in thin, stainless steel tubes, pressed into place in the head. Throughout the injection system, all parts are accessible and adjustable independently of the valve system and without disturbing the valve rocker covers.

The American Bosch governor of the centrifugal type, with torque control and speed-droop features, is built onto the outboard end of the pump body, acting directly upon the rack. The governor's action is such that when the vehicle is coasting or drifting above idle speed, the rack is moved to no-delivery position, so that the full compression of the engine is effective for vehicle retardation or so-called engine braking. Fuel filtration is by a single cartridge-type filter, provided with an air bleed, connected with the return line, to automatically purge the system of any entrapped air.

Structurally, the engine comprises a single block casting, including the six cylinders and deep crankcase, with the heads cast in threes, the two head castings being interchangeable. The oil pan is of pressed steel and is produced in two types, namely with the sump at the rear or at the front, to accommodate different front axle locations. Valve porting is individual, with manifolds on opposite sides.

Cylinder liners are of the dry type, centrifugally cast. For the protection of the head gasket, there

View showing the head lifted to display the flat undersurface, eighteen stud retention and individual exhaust ports.



Sketch showing arrangement of the combustion chamber in the crown of the piston, the flat head deck, valves and inclined injection nozzle.



is an extension lip on the inward edges, with minimum clearance under the head, which protects the edge of the gasket from direct impingement of flame. Water jackets are full depth of the cylinders, terminating at the bottom as a flat plane between the cylinder bores to provide a large surface for splash of oil throw-off for assistance in oil cooling.

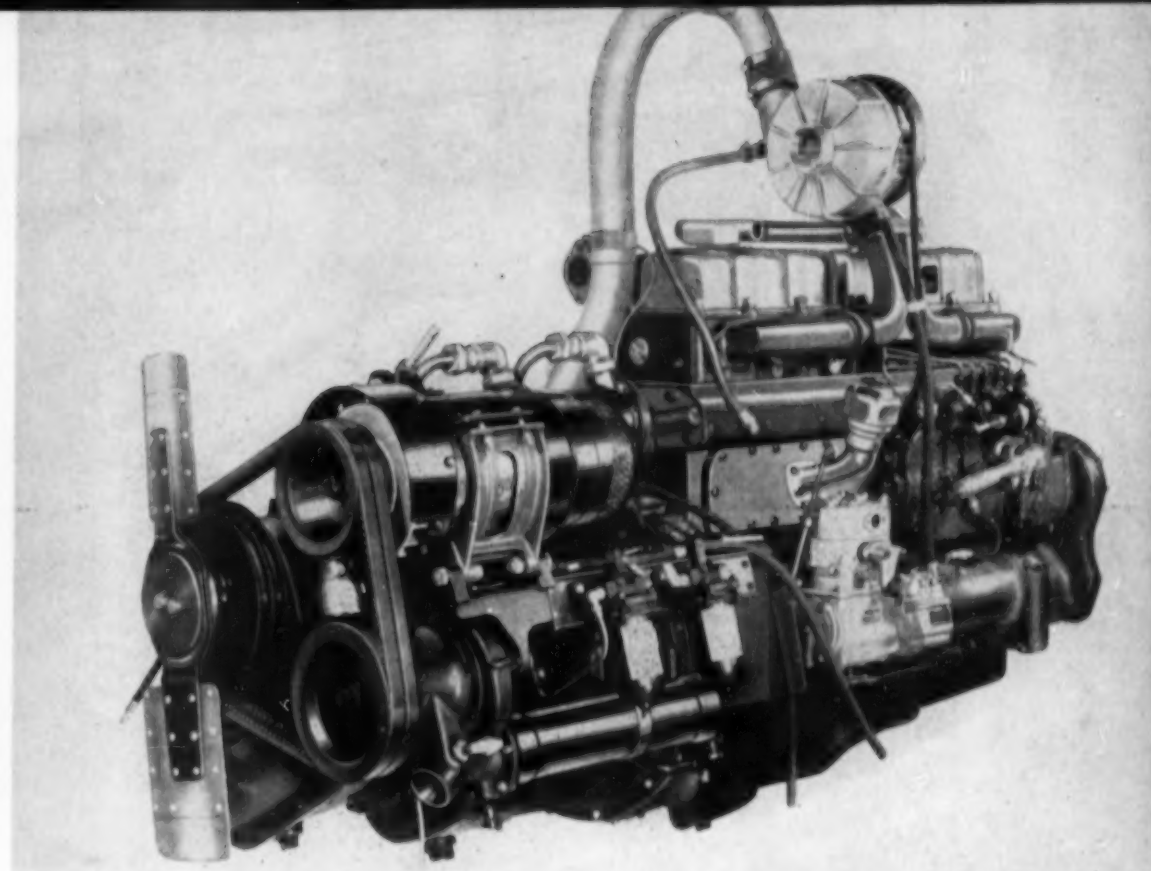
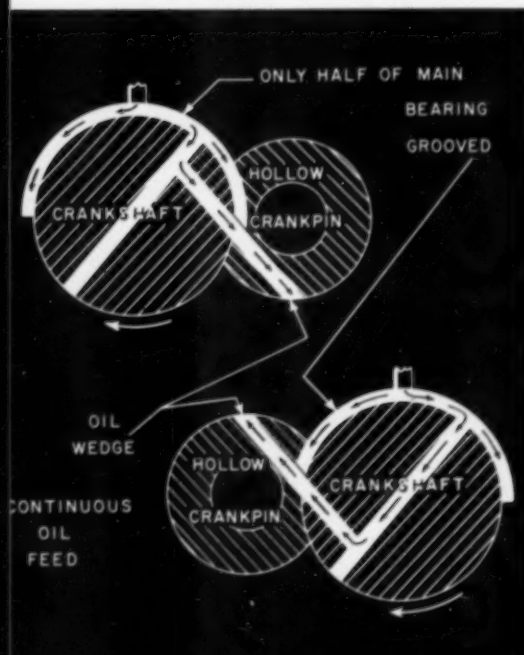
Both crankshaft and camshaft are carried in seven bearings each, a third shaft on the right side being provided to drive the air compressor and tachometer. Fully counterbalanced by twelve integral counterweights, the seven-bearing crankshaft has 4-inch journals and 3-inch crankpins. The latter are bored out hollow and left open with two purposes in view. Primarily the reduction in spinning weight serves to augment the effectiveness of the counterweights. Secondly, the open bores aid materially in cooling the crankpins. The shaft is Tocco case-hardened and heat-treated, with the fillets polished.

Pistons are of aluminum alloy, with floating wristpins. They carry five rings, three compression rings and one oil ring above the pin and one oil ring below. The top ring is of the keystone form, placed well below the top of the piston, is chrome plated and the groove is protected by a Ni-resist insert, bonded both mechanically and by the Al-fin process. All compression rings are of narrow face for good sealing and minimum cylinder wear. Oil rings are flexible U type of steel, chrome plated.

Valves are in tandem, operated by the conventional pushrod and rocker-arm system. Both intake and exhaust valves are hard-faced at 30-degree angle, the exhaust valves being seated in inserts of a special alloy developed by Mack, known as Niferite, Stellite-faced and copper-plated. These inserts, owing to their expansion characteristics, are a mild fit, thus avoiding loosening and distortion.

Full-pressure lubrication is supplied from a submerged gear-type oil pump driven by helical gears from the camshaft. From the pump, the oil is delivered to an oil gallery bored out of the engine block at the bottom of the jackets, from which pressure feed extends to the seven main bearings, the

Schematic drawing showing the flow of oil through skewed oil passages rifle-drilled through the crankshaft to connecting rod bearings at a wedging angle. Through passage in main journal provides continuous flow with only top of main bearing grooved.

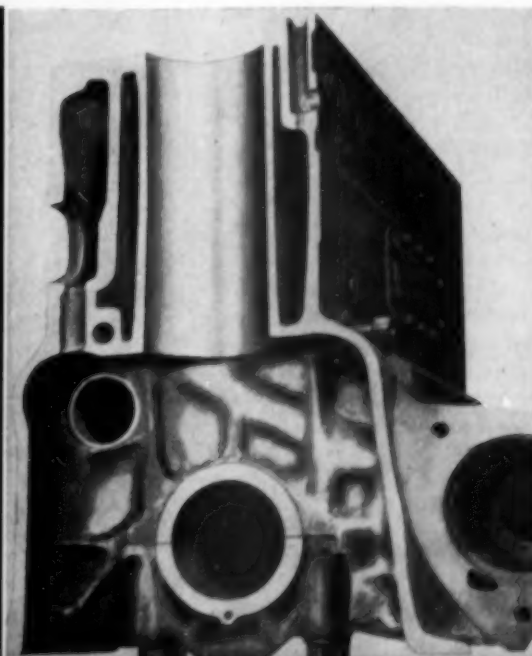


Rear face of the bus type Mack turbocharged engine and torque converter transmission showing arrangement of fan, water pump, generator drive and high mounting of the Schwitzer-Cummins turbocharger.

seven camshaft bearings and the two auxiliary shaft bearings. Oil is supplied to the connecting rod bearings in the manner already described and drillways in the rods supply the wristpins. Oil under pressure is also fed to the valve rocker shafts and thence to the rocker bushings. Drilled leads in the rockers supply oil under pressure to the upper ends of the pushrods and to the valve stems. Additional passages provide drip feed to the valve stems. Lubrication of the flange-mounted air compressor is provided under pressure from drilled leads in the hollow auxiliary shaft to the drilled compressor crankshaft and external connections supply the Luber-finer oil filter and the turbocharger.

Cooling is on the directed water flow principle, water from the pump being conducted by a water gallery running the length of the block, just under

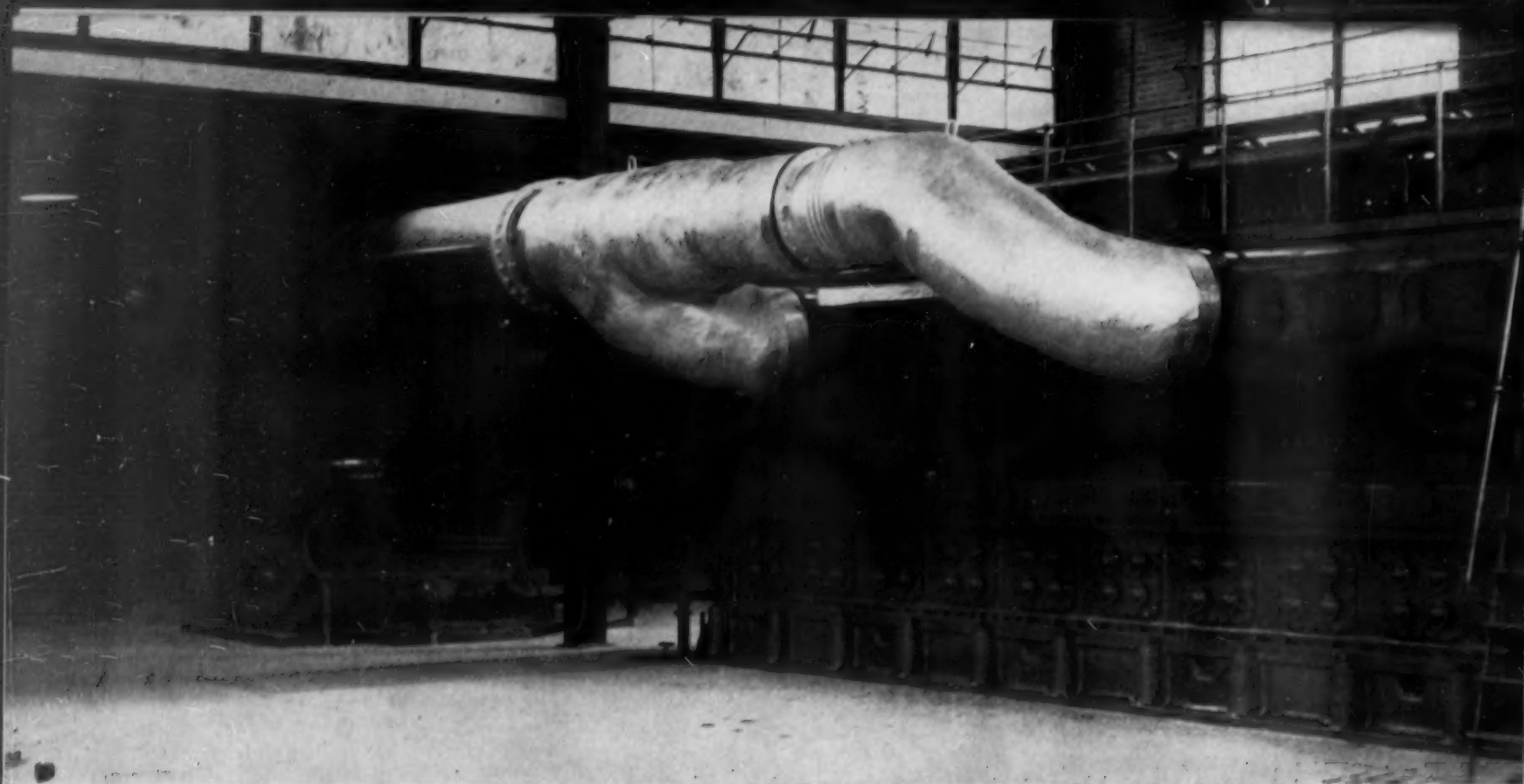
Section through block showing the deep crankcase section, long water jackets with lube oil gallery at bottom of jacket, at left, and flat under surface of base of block for better control of temperature.



the head, to ports by which the major portion is directed about the injection nozzles and exhaust valves, a minor share passing downward into the cylinder jackets, from which it rises through the heads and out to the radiator. The water pump, of the centrifugal type, is of the ball-bearing packless type with a shell-moulded impeller.

Although basically identical and with identical outputs, the bus and truck versions of this engine differ in arrangement to adapt them to the distinctly different installations in the two classes of vehicles. In the truck form it is arranged for longitudinal mounting in the chassis, with the radiator in front and the usual triangular belt drive for the water pump, fan and generator. For bus installation, the engine is arranged for transverse mounting at the rear, the head end at the right, driving through a torque converter and angle drive at the left. The radiator is located at the extreme left end of the powerplant compartment. Consequently the accessory drive is at this end, being driven by a constant-running through shaft, passing through the hollow quill shafts of the torque converter and transmission. This through shaft terminates in a pair of gears, through which the fan is directly driven and from which belts drive the water pump and generator.

Because the rear face of the engine, normally on the right side, is exposed when the rear doors of the powerplant compartment are opened, most of the accessories are mounted accessibly on this face. To reduce the encroachment of the powerplant on the passenger space, the engine is also tilted rearwardly at 18 degrees. In addition to the standard-weight models, Mack Thermodyne diesels of both the naturally-aspirated and turbocharged type are also made in weight-reduced form, featuring aluminum alloy flywheel bell-housing, valve lifter covers and various fittings.



Exhaust side of the new Fairbanks-Morse Model 31AD18 dual-fuel engine which was installed in the Morgan City plant in 1955. The unit develops 3500 hp. Roots-Connorsville blower and F-M blower motor are at rear.

MORGAN CITY, LOUISIANA

Louisiana Plant, With 7 Fairbanks-Morse Engines, Earned More Than \$1,000,000 in Net Profit; Recently Installed 3500 Hp Dual-Fuel Unit; More Expansion Seen

WHENEVER the city fathers of Morgan City, Louisiana, take time out to look over their domain, they are pretty sure another natural resource will pop up pleading for development. Located in St. Mary Parish on the Atchafalaya River and Berwick Bay, 92 miles southwest of New Orleans in the beautiful Bayou Teche country, there are superb marine transportation facilities on its doorstep, oil and gas fields in its backyard, rich sugar cane acres all over, fur-bearing wild life, deep sea fishing, the finest sea food and a climate just about perfect for work or play.

Back in 1908, before most of the city's natural resources had any great market, it was served by a small direct current lighting plant installed by private interests. Under the impetus of the city's development program, this modest plant grew through the years into a modern 6981 kilowatt municipal power station, a development culminating in 1955 with the installation of a 3,500-hp Fairbanks-Morse dual-fuel engine. The first few years of growth were the hardest but by July 1, 1953, the city had completed and put into service its own plant with two 630 hp Fairbanks-Morse

diesels. However, the community's rate of growth demanded more in the way of energy. It had outstripped plant capacity by 1940 and in the decade that followed three new Model 33 F-M diesels, with a total horsepower of 3850, were installed. The expansion program was resumed in post-war years with the addition in 1952 of a 1920 horsepower F-M opposed-piston dual-fuel engine.

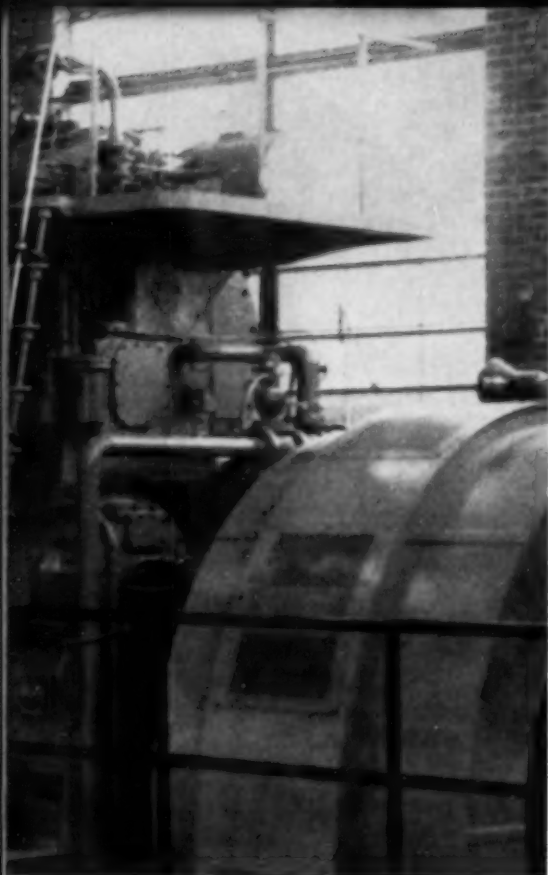
Toting up the score in 1950, Morgan City found itself well out in front. Total sales of electricity by the Morgan City Light and Power Plant went from \$38,000 in 1934, the first whole year of operation, to \$320,000 in 1950, a total of \$2,267,240.96 for the period from 1934 to 1950. From this income total, the city derived a net earning of \$1,064,804.26. The outlook for the 1950's promised to be even better. A splendid new array of by-products had been cooked up by the nation's research chemists from natural resources, more and more people flocked to Morgan City to enjoy its recreations and climate and its marine industry was thriving. The population approached the 10,000 mark, new housing projects were going up and concomitant uses for power—in air conditioning

and myriad modern household appliances—made a fresh, bigger demand on the community for added electric power.

In December, 1953, Morgan City awarded the contract for its largest installation, a 3,500 hp generating unit and specified that the new building to house it should be spacious enough to contain two more future units. The new unit, put into service early in 1955, consists of a 10 cylinder, 18 x 27, Model 31AD18, Fairbanks-Morse dual-fuel engine, rated 3,500 hp at 277 rpm, direct connected to a 3429 kva, 13,200 volt, 3-phase, 60-cycle, F-M alternator with 30 kw, 125 volt, V-belt driven exciter. Scavenging air is supplied by a 24-in. centrifugal blower driven by a 300-hp, 2200 volt

The plant operating staff is pictured with a representative of the engine builder. Left to right: Nick Smith, Superintendent Joseph Cefalu, Chief Engineer Carol Soumrcillan, Field Engineer Tom Young of Fairbanks-Morse and Higgins McCloy.





motor. The motor is connected to the generator leads of the engine served through a 300 kva, 3 phase, dry type transformer. A 1 kw motor-generator set is used to force the field of the generator to provide a quick surge of power for the blower motor when the engine is started. A 3750 kva, 13,200 volt-2400 volt, 3 phase transformer ties in the new plant with the old, which stands just south of the latest structure.

Because the greater portion of the load at Morgan City is located on the opposite side of the city

from the plant some three miles distant, it was thought impractical to try to distribute the current at 2400 volts and Mr. J. J. Cefalu, Superintendent of the Morgan City Plant, decided the best distribution voltage would be 13,200. Consideration was given both to generating at 13,200 volts and generating at 2400 volts, stepping up the voltage from 2400 to 13,200 volts at the plant for distribution at the higher voltage. For the single unit which was just installed, generating at 2400 volts would have been convenient but it was decided to look ahead and standardize on 13,200 volts for this and all future generating units.

In Louisiana Summer weather, keeping cool is as much a problem for engines as for people and the Morgan City Plant has made provision for the most arduous operating conditions. Soft water is circulated by a motor-driven 6-in. centrifugal pump through the 3,500-hp engine and through a shell-and-tube heat exchanger. The river close to the plant provides a convenient source of raw water which is supplied to exchangers and lube oil coolers by a pair of 12-in., 4-stage turbine pumps driven by 50 hp motors. Thermostatic valves keep engine water and lube at desired temperature levels. Scavenging air is drawn through an ample filter and then cooled and humidified in an air washer. Lube oil is cleaned continuously by a full-flow strainer and part of the oil is bypassed to a cartridge-type filter. The engine is served by an auxiliary lube pump driven by a 10 hp motor. Located close to the new engine is a gauge panel with pressure and temperature gauges, alarms, and an exhaust pyrometer. Flexible sections are provided to absorb vibration in the exhaust and oil lines, 24-in. corrugated stainless steel for the exhaust and 6-in. braided line for the oil sections.

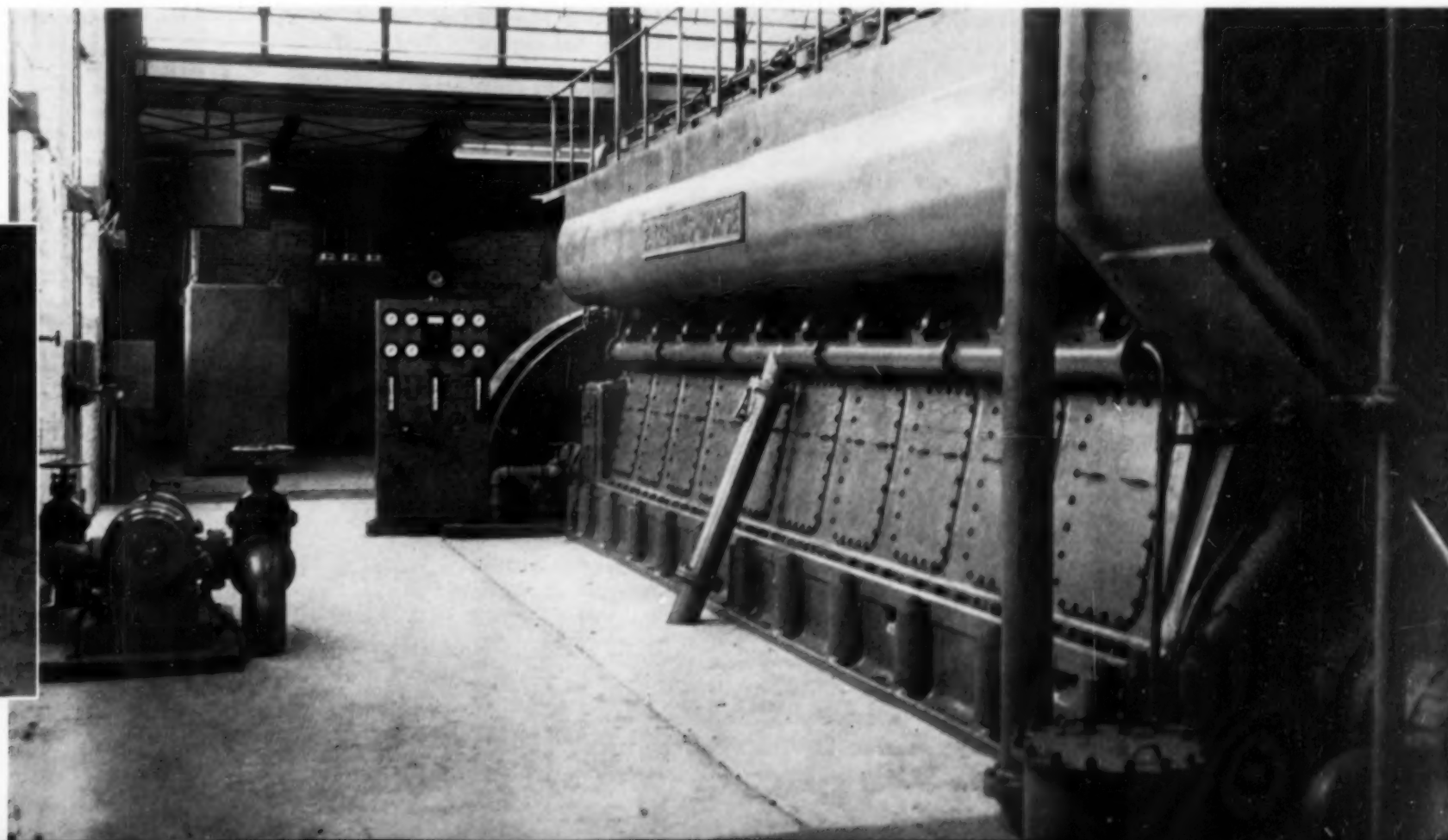
The Morgan City Plant has not only been efficient and profitable but durable as well. Since 1940 maintenance costs have averaged just 95 cents a horsepower per year. In the last year for which we have figures, the cost was a low 53 cents. This is all the more notable because it includes repairs to pumps, motors, generators, water purification equipment and lawnmowers. Expansion at this plant is a continuing process with increasing population, business activity and air conditioning load.

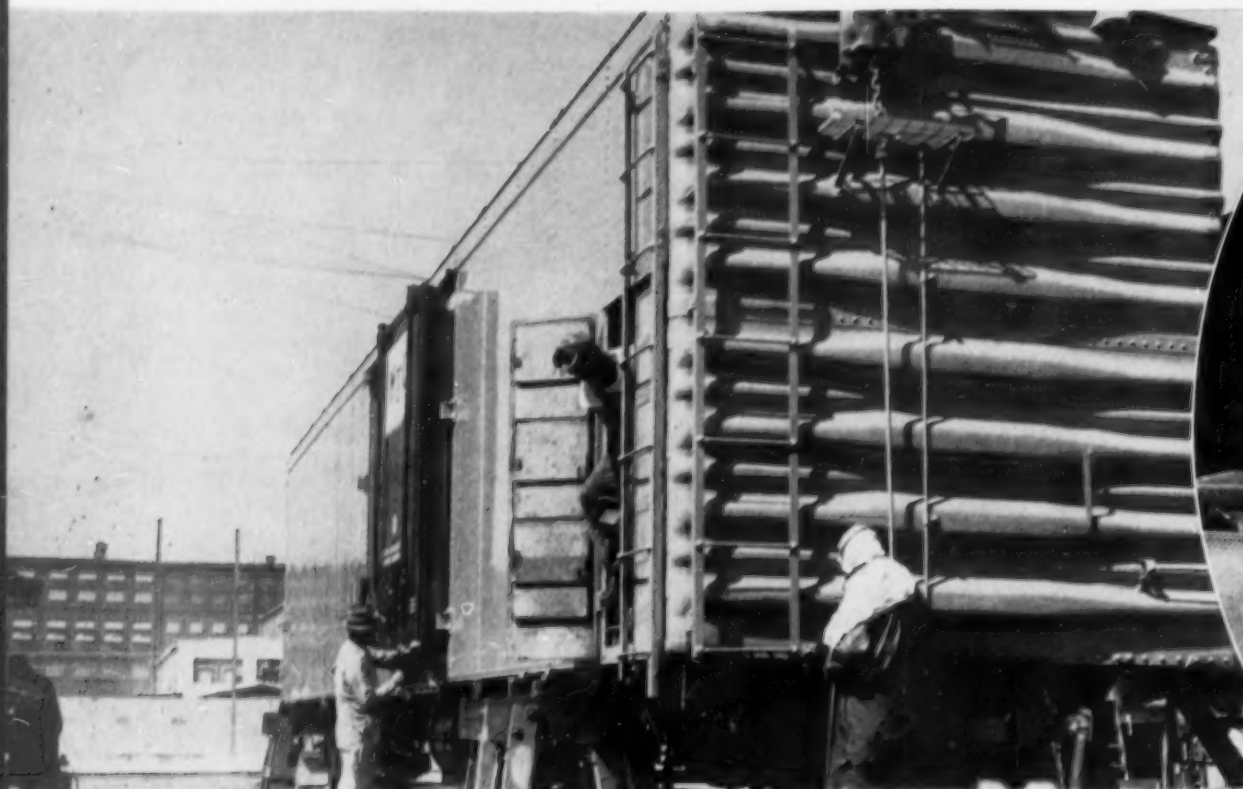
But the plant is ready. With space available for two more power units, Morgan City fathers won't mind in the least if some of the vacationers' Geiger counters start popping.

List of Equipment

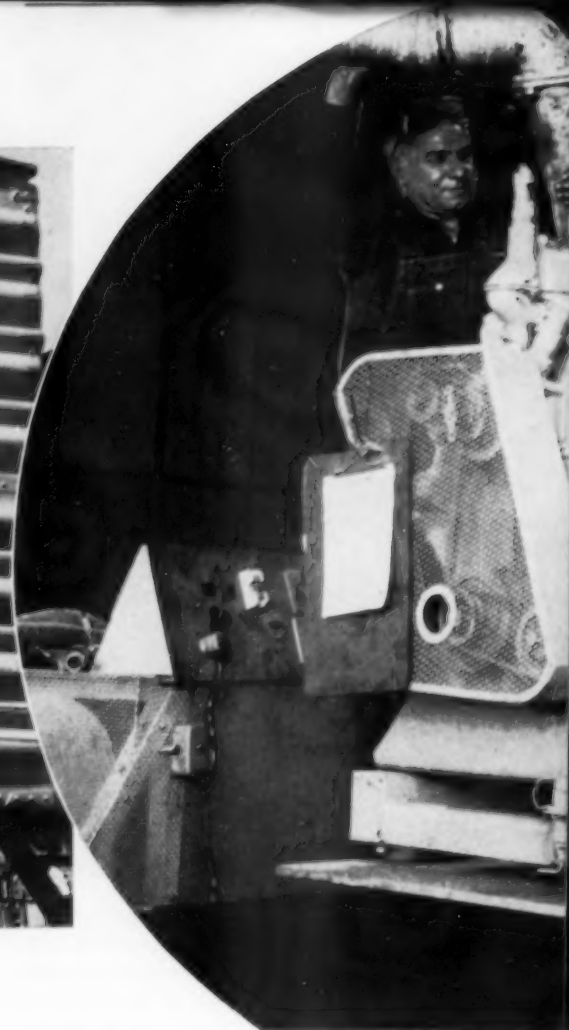
Engine—Fairbanks, Morse 3500 hp 31AD18, 10-cylinder, 18 x 27-in., 277 rpm, dual-fuel engine.
 Alternator and Exciter—Fairbanks Morse.
 Heat exchanger—Kewanee-Ross.
 Oil cooler—Kewanee-Ross.
 Lube strainer—Air-Maze.
 Auxiliary lube pump—Roper.
 Lube oil filter—Hilliard.
 Motor generator set—Fairbanks Morse.
 Starting air compressor—Gardner-Denver.
 Blower—Roots-Connersville.
 Switchgear—Westinghouse.
 Air intake filter—Continental Air Filter.
 Pyrometer—Alnor.
 Oil & water temp. thermostats—Amot.
 Alarm contacts—Detroit Lubricator.
 Gas regulator—Fisher Governor.
 Gas meter—American meter.
 Liquid level meter—Liquidometer.
 Flexible hose—Flexonics.

The 3500 hp engine has an F-M gauge panel conveniently close. Also visible are the F-M fresh water pump and the Air-Maze lube strainer.





When an MTC car comes in for its annual check at San Bernardino, it gets a complete check inside and out, including a paint job.



SANTA FE ORDERS ANOTHER 200 MTC REEFERS

By JAMES JOSEPH

U. S. railroads which always thought in terms of bigness when it came to dieselization, must now think "small"—in terms of the 40 hp, two and four cycle engines powering the growing ranks of low-temperature reefer cars.

Santa Fe, as typical tracked its first MTC (mechanical temperature control) reefer in 1950. In all, 31 prototype MTCs are currently operative. The cars' refrigeration and diesel systems, though the product of several manufacturers, are basically the same. Mechanically, temperature-controlled cars are 50-ft. long, super-insulated, have capacity for 65-tons of frozen foods, with temperatures held to -10-12 degree F. Each carries its own, self-contained refrigeration system, powered by a 40 hp at 1200 rpm diesel engine (models by Hercules, Caterpillar, Waukesha, International and Detroit). Engine is directly connected to a 25 kw, 220-volt, 3-phase, 60-cycle alternator furnishing power to a 15 hp at 1750 rpm, totally enclosed compressor motor. Refrigeration units (Trane, Frigidaire, Carrier, Waukesha and Thermo King) use Freon-12 as refrigerant. Compressors are rated 15 tons at 40-degree suction and 105-degree condensing, are capable of 26,000 Btu's/hr at minus 20-degree evaporating, plus 120-degree condensing.

Now, after two years' operating prototypes, Santa

Fe has: (1) ordered another 200 Trane refrigeration units; (2) scheduled MTC car-building at its West Wichita, Kansas shops; (3) redesigned layout of refrigeration-diesel components, aiming to minimize maintenance. Santa Fe expects to have all 200 new MTCs in operation by the end of 1956 (150 of them were scheduled for service during 1955). What engine will power the Trane units isn't known at the moment, though there's some indication that the Detroit engine will get a high proportion of orders. Meantime, Santa Fe is preparing a big routine maintenance program, has set-up annual overhaul at San Bernardino, Calif., a dozen sub-maintenance stations elsewhere along its trackage.

The 2-year shakedown has shown need for: (1) redesign of the refrigeration-diesel component; (2) elimination or shortening of some piping runs; (3) repositioning of engine-compressor shock-mounts; (4) "packaging" as many units on one shock-mounted base as possible, thus reducing vibration; (5) replacing compressor's metal suction-side hoses with fabric-neoprene units. But let's look at Santa Fe's carefully worked-out maintenance set-up.

Pre-Trip Inspection: each time an MTC is unloaded, it's given a pre-trip inspection, a job that

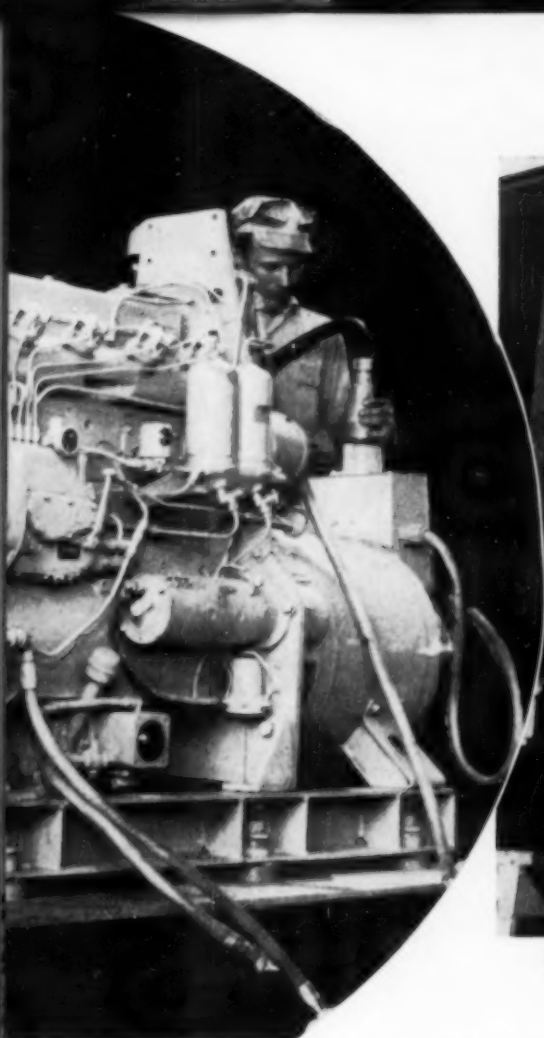
usually requires the car's overnight detainment, the services of maintenance specialists and car men (who check trucks, brakes, etc.). Pre-trip maintenance is routine along Santa Fe's trackage, is done at 10 main stations (among them Los Angeles, San Bernardino, Barstow and Richmond, in California; at Kansas City, Chicago, Clovis and Albuquerque, in New Mexico; and Cleburne, Texas).

"The pre-tripper," points out one Santa Fe maintainer, "is really just an inspection, some 29 checks of the refrigeration system, another 22 points of the diesel system which need watching." Each check-point is inspected, the work "signed-out" on a special "pre-trip" inspection sheet (incidentally, Santa Fe's San Bernardino shop keeps a permanent repair record of every car. Additionally, as a reefer heads cross-country, an "En Route" report travels with it. On the "En Route" report, division point inspectors note car temperature, suction pressure, engine temperature, voltage, level of fuel tanks (each car has four 100-gallon diesel fuel tanks), and additions on lube oil.)

Here are some important pre-trip check points: (1) Fill fuel tanks. (2) Drain water and sediment

An electrician checks compressor end of an MTC car's diesel-compressor during a routine check-up.





Load testing an MTC diesel engine during overhaul at Santa Fe's San Bernardino, California shops. The unit shown is an International, 4-cyl., 52 hp driving a 25 kw D. W. Onan alternator.

Refueling an MTC car's diesel engine tanks which are located under the car. Fuel is drawn from a 331 gallon portable rig.

from fuel tank sumps. (3) Repair fuel oil leaks at tank and piping. (4) Check lube oil level in engine crankcase. (5) Change oil in fuel injection pump. Use crankcase oil. (6) Check oil level in engine governor. (7) Clean air cleaner and replace oil (use crankcase oil). (8) Inspect rubber connection between air cleaner and intake manifold pipe. (9) Clean primary fuel pump strainer. (10) Lubricate water pump. (11) Check air box drain and breather to make sure they are open. (12) Check operation of protective devices (low oil pressure and engine temperature). (13) See that engine runs normally and that no fuel or oil leaks are present.

En route, the car is usually checked at each division, this a minor inspection whose main function is to see that: (1) equipment isn't damaging itself; (2) there's enough fuel; (3) the 24-volt, 17-plate battery is charged; (4) the temperature is held at an operational -10 degrees or lower.

Bi-monthly Inspection: the every 60-day inspection incorporates the pre-trip servicing, plus some 8 additional checks (performed at any pre-trip maintenance station). The two-month maintenance ad-

ditions: (1) Change fuel oil filters. (2) Change lube oil filters. (3) Remove and clean oil level regulator strainer bowl. (4) Change engine lube oil. (5) Lubricate all linkages. (6) Clean crankcase breather and replace oil. (Use crankcase oil.) (7) Clean engine coolant radiator with compressed air. (8) Check operation of emergency fuel cut-off valve from all pull rings.

Semi-Annual Inspection: (diesel only, excludes refrigeration system) the semi-annual, performed at any maintenance station along Santa Fe's track-age, incorporates all pre-trip and two-month checks, plus five additional: (1) Check injectors and timing. (2) Check fuel pump timing. (3) Check injector nozzles. (4) Remove and inspect starter motor and battery charging generator. (5) Check valve lash or valve tappet adjustment.

Importantly, Santa Fe schedules maintenance strictly by service days, without regard to run-hours. Explains a maintainer at Santa Fe's big San Bernardino shops, "We've got to assume that a car saw fairly continuous service. A car might go off our lines, be away quite awhile before coming back to us. Right now, though, with relatively few MTCs in service, we get our cars back in a hurry. So we schedule strictly by days—assuming that engines have run an average number of hours in any maintenance period."

Annual Inspection: MTCs get an annual overhaul only at San Bernardino. Where intermediate inspections dealt mostly with checking, the annual incorporates both checking and setting (systems are reset, carefully re-calibrated). Involved are some 69 points in the refrigeration system, another 60 in the diesel.

Biennial Inspection: Santa Fe as yet hasn't spelled out the specifics of this every two-year inspection, though it will likely include these important points: (1) Renew rings and pistons. (2) Check liner for wear. (3) Renew cam rods and mains. (4) Re-calibrate fuel pump and inspect. (5) Clean exhaust manifold. (6) Remove generator and exciter from engine. Run insulation test, install new brushes, new bearings in exciter, check for alignment between exciter-generator and engine, check commutator. (7) Run load test for rated hp.

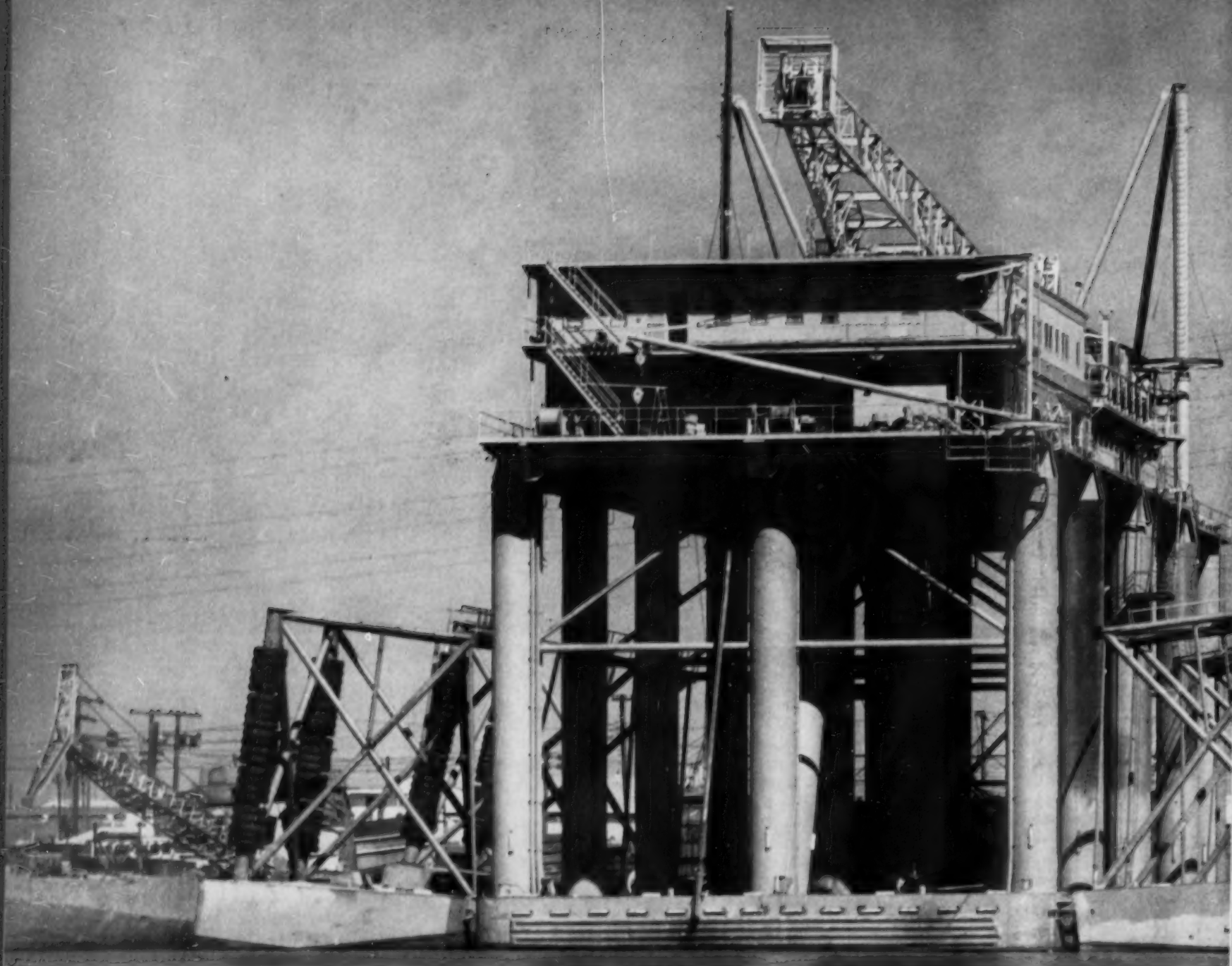
What of revisions found necessary during the past two years' shake-down? Santa Fe explains that some faults showed up in all or most components. "This was a pioneering effort," points out a maintainer, "Pioneering both on our part and on the part of the component makers."

Incorporated in the 200 new MTCs were a number of changes which were required as a result of the earlier operational experience. They include larger bearing surfaces for the exciter bearings; a change to metal-reinforced neoprene shock mounts; mounting the engine and generator as a package (it is now believed by Santa Fe engineers that this would improve resistance to vibration); adaption of a standard for MTC engine water, 50% water and 50% anti-freeze all year 'round.

In addition, the elimination of the belt-drive, re-locating the radiator on the engine mount, mounting a new Rotonomic air filter on the air intake and changing the crankshaft seals will make the MTCs operationally more efficient and more economical to maintain. All the changes were the result of shake-down runs testing a wide variety of refrigeration and diesel engine components.

A Santa Fe maintainer checks piping, cautious, as always, for vibratory looseness.





The American Tidelands drilling barge 101 showing the relative position of the stabilizing pontoons. Power for drilling is provided by five GM 8-268A Cleveland diesels with Marquette governors for a total of 2,000 hp to drive Elliott generators and mud pumps.

DRILLING BARGE "101" GOES BACK TO SEA

By JAMES W. CALVERT

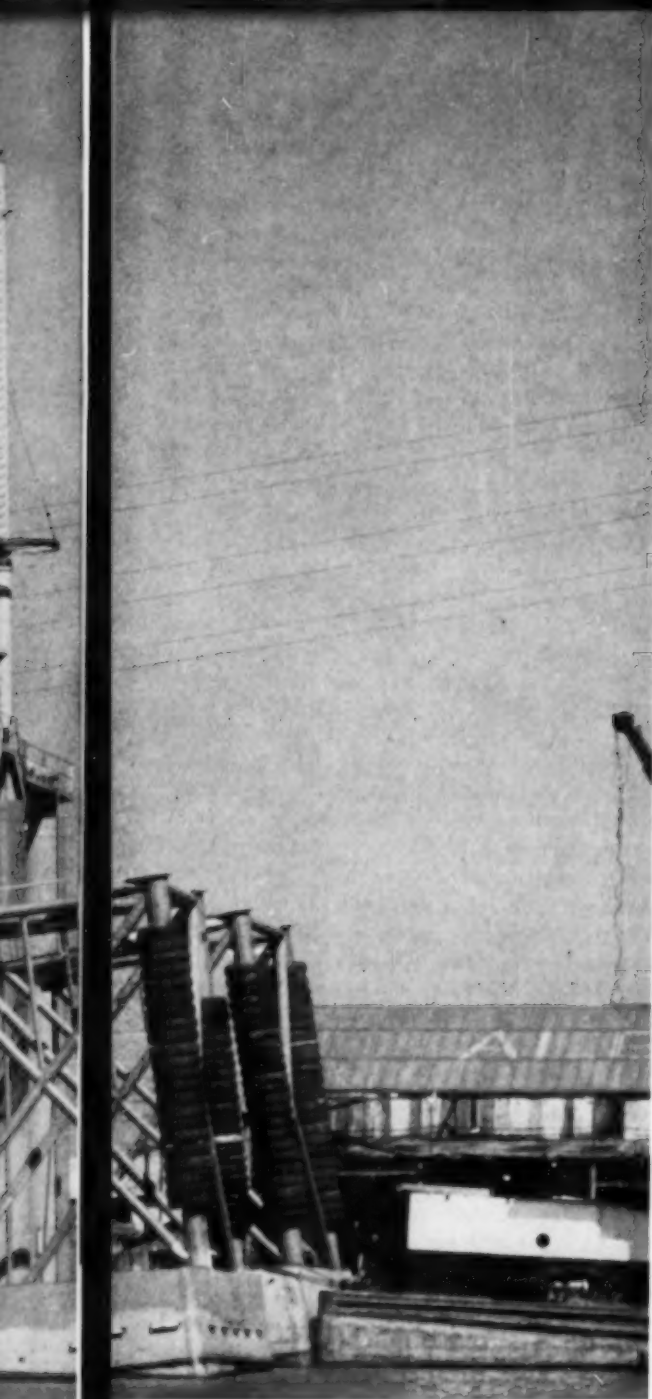
IN their search for oil and gas beneath the waters of the Gulf of Mexico, petroleum engineers and naval architects have taxed their ingenuity to provide structures that will withstand the forces of nature, and at the same time provide a platform that will support a drill boring five miles or more into the bowels of the earth. It has been estimated that more than a billion dollars has been spent in prospecting these offshore areas,—at least half of which represents the cost of drilling structures, barges and dieselized rigs.

Most ingenious of these strange and massive tools

is the submersible barge, such as American Tidelands' 101. It can be towed to a location at sea, submerged for the drilling operation, and then refloated and towed away when the job is completed. Within a period of two years since Congress passed the Tidelands Act, enabling oil companies to resume their exploration of the submerged lands, 11 such barges have been constructed and put into operation. Plans are on the drawing boards for at least 10 more to be built this year.

Basically, there are three types of platforms, capable of drilling at varying depths of water. One is the

structure whose drilling platform is the barge itself. It is floated to the location where giant spuds, or legs, are hydraulically driven into the floor of the ocean. Then the platform is pushed up these legs to the desired height by the same hydraulic jacks. Another type consists of a barge and fixed platform which is anchored at its drilling location by spuds driven into the sea floor. The drilling platform remains at a fixed height above the water. Most of these submersible structures, however, fall into a third class,—the drilling platform on stilts at a fixed height above the barge. Once on location, the barge is flooded with sea water and settles to



the floor of the ocean, held in place by its own weight and by stabilizing pontoons which are thrust downward by hydraulic rams.

The basic patent for this last-named type is held by John Hayward of Tulsa, who developed the first such barge while an engineer with Barnsdall Oil Co. shortly after World War II. Such is the American Tideland's 101, owned and operated by corporation headed by Thomas L. Jordan, New Orleans business man and barge line operator. He has been credited with bringing more advancements to river transportation than any man since the early days of steamboating on the Mississippi.

The 101 is unique in that she was the principal performer in the first and (up to the time of writing) only major accident to have occurred in the history of offshore drilling in the Gulf, although more than 850 wells have been completed under the most arduous of operating conditions. The 101 was completed last February, leased to Humble Oil & Refining Co. She had completed her first drilling

assignment and was being refloated for towing to a new location when she capsized early one morning last June. For days she rested on her side in 35 feet of water while salvage operations were in progress by J. Ray McDermott & Co.

Towed to the builders yard, Alexander Shipyard, Inc., in New Orleans, the 101, was completely refurbished. Her GM diesel engines were overhauled. Her million-pound derrick and drawworks were replaced, and her intricate electrical system repaired. The reconditioning of the 101 was completed on October 28 and the barge has returned to her second assignment for Humble, off the Louisiana coast.

The American Tideland drilling rig consists of a submersible barge, measuring 200 X 74 X 12 ft. Welded to this are cylindrical steel columns, 6 ft. in diameter. They tower 52 ft. above the hull to support the two-storied superstructure which comprises the drilling and storage deck, air conditioned living quarters for a crew of 45 men, and a helicopter deck. The overall height of the structure from the bottom of the hull to the top of the helicopter deck is 93 ft. The huge barge resembles the framework of a 10-story building, with its jackknife derrick towering 142 ft. above the top of the superstructure.

The barge is diesel-electric powered, and the machinery deck is on the lower level of the superstructure, housing the five-diesel-engine compound with a total of 2000 hp, two 850-hp mud pumps and a 150-hp mixing pump.

The rig's main power comes from the battery of five GM Cleveland diesel engines, Model 8-268-A, rated at 500 hp each. They operate through a chain-drive compound to turn the two Gardner-Denver GXR mud pumps, and the two 600-kw Elliott generators which develop 280 volts at 1100 rpm. The two generators are linked in series with two 800-hp



Thomas L. Jordan, president of American Tideland, Inc. and an important figure in Mississippi River transportation is shown with his daughter, Gay Jordan, who christened the giant barge when it first went into commission.

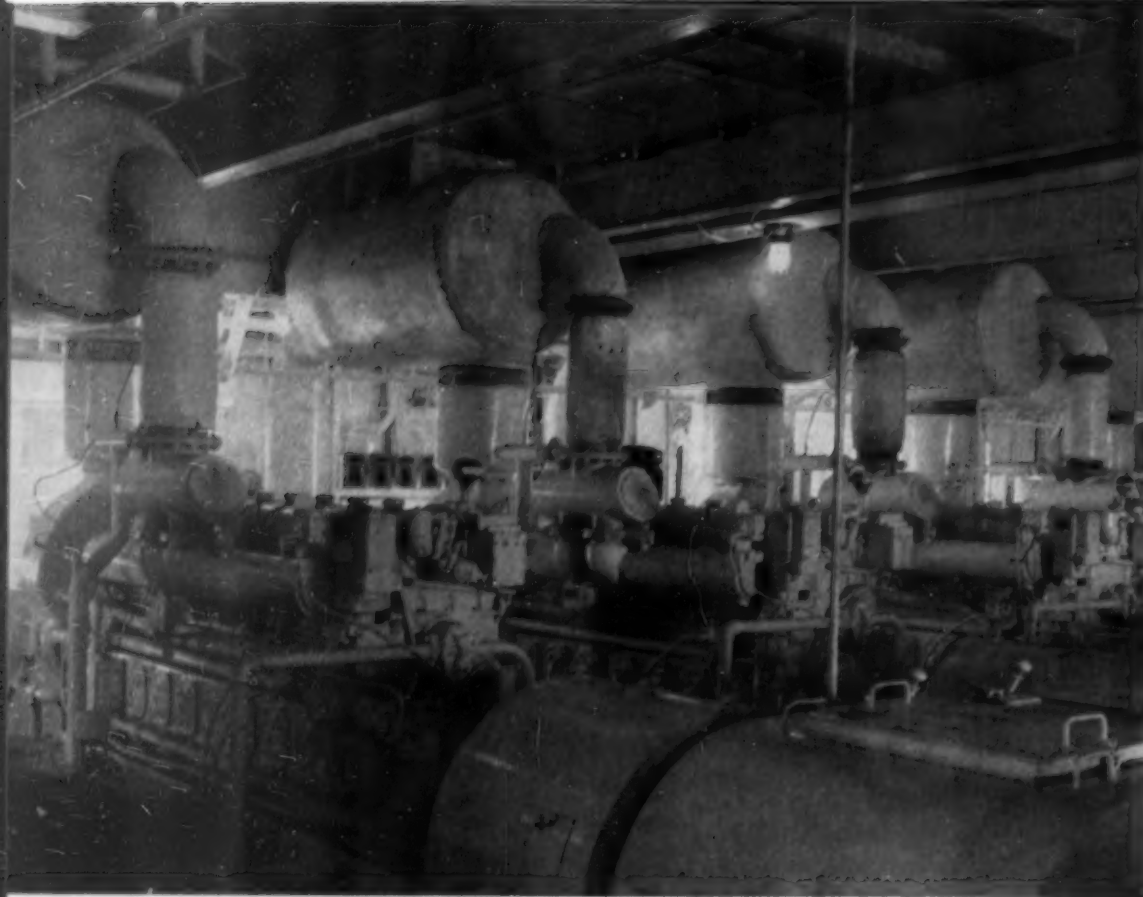
matching Elliott electric motors to drive the Emsco drawworks and rotary table. These motors are completely enclosed against any possible gas-contaminated air from the well head. Air for cooling is pumped through ducts from barge's housing end.

The Gardner-Denver agitator pump for the mud pits is driven by its own GM 6-71 Detroit diesel engine. Three other GM Detroit diesels drive 100-kw Delco generators to supply lights, air conditioning and other barge facilities. The supplementary machinery includes Howco T-10 cementing pumps, Hydral accumulator to operate the Hydral and Cameron blow-out preventers, and a Schlumberger logging unit. The Lee C. Moore jack-knife derrick, with its 1,000,000-pound capacity, gives the barge an estimated drilling depth of 18,000 feet.

Aft of the machinery deck and amidship of the

The American Tideland barge is shown poised in her slip at Alexander Shipyards, New Orleans, awaiting tugs to take her to a drilling location in the Eugene Island area of the Gulf. The barge was completely overhauled after she capsized off the Louisiana coast. She can operate in up to 40 feet of water.





The main engine room of Barge 101 showing the five Model 8-268A Cleveland diesels with Marquette governors and the Elliott generators in the foreground. The engines provide 2000 hp.

superstructure is the storage deck for drill pipe, casing, cement, liquid mud tanks and bulk mud hoppers. Mud tanks have a capacity of 1200 barrels of liquid drilling mud and there are storage facilities for 4800 sacks of bulk mud and 1500 sacks of bulk cement. Storage tanks in the forward end of the submerged hull have a capacity of 2500 barrels of drilling water. Two of the hollow vertical columns are used to store 500 barrels of potable

water and four others provide storage tanks for 1000 barrels of fuel oil.

On the second story of the superstructure are the air conditioned living quarters for the crew. State-rooms, showers, recreation areas, and a completely equipped galley and dining room are designed to provide maximum comfort in what has traditionally been an arduous life—that of the oil field worker.

After the 101 capsized, it took the Ray J. McDermott & Company Derrick Barge No. 9 twenty hours of steady lift to raise her. This barge with its 800-ton crane and Waukesha Model LRDBS turbo-charged diesels was the only vessel capable of raising the 4,000 ton monster. The Waukesha engines drive 200 kw, 3-phase, 480 volt generators which were built by Reagan Equipment Co. of New Orleans.



The hull of the vessel is a steel barge which gives the rig bouyancy while it is being towed to the drilling location. On either side of the hull are large stabilizing pontoons, which are lowered and locked into position against the bottom of the sea to hold the structure in place and to prevent any possible shifting due to scouring of the bottom. One compartment of the hull is sealed off to provide space for the pumps and auxiliary equipment and a stairway leads down through one of the slanting steel cylindrical columns to permit workmen to enter this space while the barge is submerged.

The drilling operation is performed through a slot, 42 ft. long and 26 ft. wide, in the after end of the barge and directly above the drilling slot is the hinged jack-knife derrick. Despite its ponderous size, the operation of the 101 is relatively simple. Upon reaching the drilling location, the ballast pumps in the hull of the barge are put into operation and the rig is submerged, one end at a time, until the vessel rests upon the floor of the sea. Then the pontoons are submerged and locked. To raise the platform, this operation is reversed. First the pontoons are unlocked and ballasted, and finally the main hull is emptied by the ballast pumps. The entire operation requires only a few hours.

Alexander Shipyard, a pioneer in the building of offshore drilling equipment, designed and constructed the American Tidelands barge at a cost of \$2,000,000. The work was begun in April of 1954, shortly after the Tidelands Act gave oil men the "green light" to resume their exploration in the Gulf of Mexico. It was completed in 10 months, first tested in the Mississippi Sound and then towed to its first location off Grand Isle where it cap-sized after completing its first well.

The corporation which owns and operates the 101 and which already has announced plans for a second offshore drilling unit, was organized in February of 1954 by a group of Louisiana and Texas business men. Officers, besides Jordan, are Spencer F. Rowan, vice president and general manager, who formerly was assistant to the superintendent of drilling and production in the Gulf area for the Texas Company; Edward H. Crane, secretary and treasurer; directors Harry B. Jordan, New Orleans; Leslie B. Durant, New Orleans; J. Edwin Hill and Perry R. Bass, Fort Worth, and Jack Frost, Dallas. Mr. Durant is also vice president of Alexander Shipyard, Inc.

Thomas L. Jordan and his brother, Harry B. Jordan, have long been identified with transportation on the Mississippi River and to them have been credited many of the innovations of recent years that has speeded the development of river transportation. They were the first to make use of the integrated tow and are credited with devising the first successful bow steering mechanism which enables long river tows to navigate sharp bends. By utilizing a device much like an outboard motor in the lead barge of a long tow, it is possible to swing the bow around a bend in much the same way that a truck turns on its front wheels. The Jordan innovations, quickly adopted by other barge lines on the Mississippi, have generally speeded transportation on the river to give new life to the industry.



The *Linwood* on her trial runs off the Florida coast. Her twin Cummins diesels give her a cruising speed of about 22 knots.

View of the *Linwood's* controls on the bridge. It includes radio pilot, depth recorder and photo electric pilot.



DIESEL YACHT "LINWOOD"

By ED DENNIS

SIXTY-FOUR feet of modern comfort, styling and high speed. That describes the dieselized yacht *Linwood* built by the Huckins Yacht Corporation of Jacksonville, Florida for J. Rupert Schalk.

This fine craft is powered by twin Cummins diesels developing 300 hp each at 2100 rpm. The engines transmit their power through a Western Gear Works "V" drive and Capital H.Y.C.D. 200 hydraulic reverse gears to give her a cruising speed of approximately 22 knots. The engines are

equipped with Elliott turbochargers and Sen-Dure heat exchangers. A 4-cylinder Waukesha diesel drives a 10 kw 120 volt ac United States Motors generating plant.

The finest and most modern equipment has been installed on the bridge. It includes a Bendix pilot radio, Bendix depth recorder and a 100 watt Apelco radio telephone.

The entire design and arrangement of the *Linwood* has placed the accent on uncluttered living

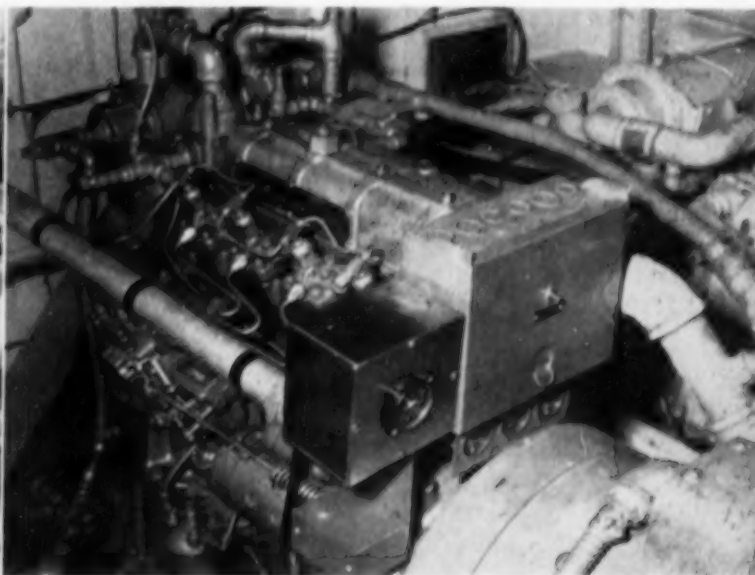
space. Besides the owner's stateroom she also has two large guest staterooms in addition to separate quarters for three crew members.

The engineering and installation of the high-speed main propulsion diesels was supervised by Cummins Diesel Engines of Florida.

View of one of the Model NRTM 600 Cummins diesels aboard the *Linwood*. Each is rated 300 hp at 2100 rpm and features an Elliott turbocharger and Sen-Dure heat exchanger.



The Waukesha diesel engine which powers the 10 kw, 120 volt ac United States Motors generating plant aboard the recently launched Florida diesel yacht *Linwood*.





Students on the way to classes at the National School of Heavy Equipment Operations, operate giant tractors pulling scraper and motor graders to the classroom site, a 71-acre tract of virgin terrain near Charlotte, N.C.



Founder and inspiration behind the unique school is Gilbert S. Shaw, who got the idea for teaching students how to operate earthmoving equipment from a truck driving school. His entire background is automotive. He plans to open a similar school on the West Coast.

Clyde found the motor grader difficult to operate. Good motor grader operators are few and far between, according to most major contractors.

SCHOOL OF CONSTRUCTION "KNOW HOW"

WHOWER heard of a school with a beautiful 71-acre campus that encouraged its students to rip it up? Well, there is such a school, the National School of Heavy Equipment Operations, located near Charlotte, N.C., where two brothers, Clyde and Ivey Hull of Morgantown, N.C., recently spent four weeks learning how to rip up virgin land. And when they had completed the course, they received a diploma for doing it.

The school, started in March, is claimed to be the only one of its kind in the world. Instead of the armful of textbooks required to complete most courses, this school furnished the two brothers with brand-new track-type and wheel tractors, scrapers, motor graders, and shovels, and showed

them how to build new roads, knock down trees, bulldoze, dig ditches, build dams, plus other phases of the earthmoving industry. Clyde, a 27-year-old former insurance salesman, and Ivey, a 25-year-old ex-GI, learned about the school from a want-ad section of a local newspaper. Neither one could tell a tractor from a motor grader, but they wanted to get into the earthmoving industry, so they enrolled in one of the three available courses. Each paid \$250 tuition fees with \$11 more per week for room and board. They ate exceptionally well and lived in quiet, clean, and comfortable quarters at the school site.

Both soon learned the art of mastering the difficult skill of earthmoving was no snap. Giant 20-ton

Each day starts out with a half-hour classroom session. Here, students learn the fundamentals of the equipment they are operating. Written and oral tests are frequent.





A real brother act! Older brother Clyde operates an International two-wheel, 172-hp tractor loading out a 13 cubic yard scraper. Ivey lends a helping hand by operating the push tractor, a 200-hp crawler type.

tractors pulling scrapers that load, haul, and dump 25 cubic yards of dirt or rock is not child's play. It's a science that relatively few master in a few short weeks. Good operators, as most contractors know, are scarce. The concentrated course required a total of 218 hours. Almost two-thirds of this total was spent in the field operating and observing the equipment. The balance of the time was spent in classroom sessions, learning the theory of not only properly operating the equipment but how to maintain it as well.

Even though the brothers have graduated from the school, they readily admit they "still have lots to learn." Although both are married and have families, they soon hope to be employed by a contractor working overseas. The higher wage scale usually found on out-of-the-country jobs is the big attraction for the two boys.

Gilbert S. Shaw, who founded the school last

March, declares that 90 per cent of the graduates have been hired by contractors. Shaw, quiet-spoken, far-sighted, and a stickler for high morals in his school, admits he started the institution more on faith than money. With more than a quarter of a million dollars invested in equipment and land, most of it has been supplied by a leading Southern equipment dealer, A. E. Finlay & Associates of Charlotte, several equipment manufacturers, and a group of civic and religious men who serve as a Board of Advisors.

Shaw is so pleased with the school's success, he now plans to open up an additional school, probably on the West Coast. Certainly Shaw's school of construction knowledge has helped alleviate the equipment operator shortage. With only nine students enrolled in the first class last March, the school already has turned out 130 students, and was booked to solid capacity of 35 students for each semester through February, 1956.

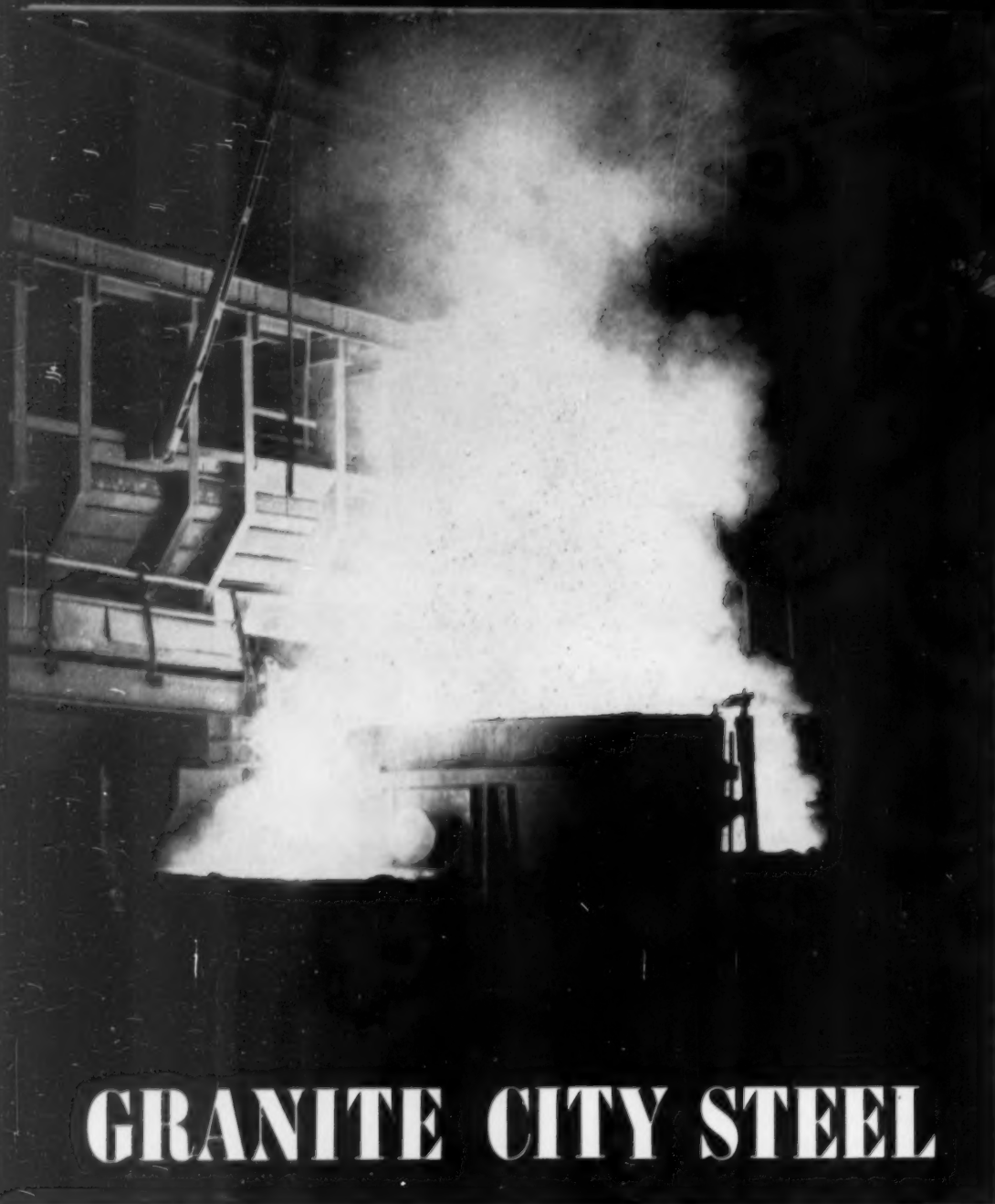
Good earthmoving equipment operators must have some knowledge of grading. Here instructors show Clyde and Ivey, along with other students, how to properly lay out grade stakes.



Shovel operators get top wages on construction jobs. Brother Clyde handles the controls on this shovel with Ivey checking the depth of cut made by the backhoe.

The Hull brothers, Clyde, left, and Ivey, right, learn how to properly lubricate a giant tractor under the watchful eye of Sumner Willis, assistant director of the school.





GRANITE CITY STEEL

Dramatic photo showing tapping a heat on one of the open hearth furnaces.

The rake reaches into the furnace to haul out old fire-brick. Another A-C HD-9G with a 2-yard shovel carries it to the railroad cars.



Rail track is pushed to a new location.

USE of diesel construction equipment in a steel mill to rebuild open hearth furnaces has cut the time for doing this in half. "Furnace availability," which means the time a furnace is in production, is thereby increased during the year to permit greater capacity for the mill without adding any new furnaces. This is what is being done by the Granite City Steel Co., Granite City, Ill. The company is one of only about 25 "integrated" steel plants among more than 200 members of the United States steel industry.

An open hearth furnace has a life of about 150 to 200 heats on the average before it has to be torn down. Before crawler tractors were used in these major overhauls, it took from three to five days before a furnace was back in production. The company put an Allis-Chalmers diesel tractor with 2-yd. shovel on this job, and Ernest G. Wahlert, consulting engineer, designed a special rake attachment to put on the shovel arm—after the bucket has been removed.

The temperature is still high inside the furnace clean out the





ion for the slag by the HD-15.

Tractor power makes it possible to tear down a furnace in three to four hours. Formerly there had to be a waiting period of 12 to 16 hours for a furnace to cool down to a temperature where men could enter with hand tools to knock down the old fire-brick. Even then the furnace was still so hot that workmen could remain in it for only short periods of time. Wheelbarrows were used to get the old brick and slag from inside a furnace. Mobile equipment also contributes to the rebricking operation. New fire brick is brought into the mill and unloaded from flat cars with a Tractomotive TL-10 front-end loader. This is also used to lift and place the platform from which the bricklayers work. A recent addition to equipment for cleaning out slag pits and checker chambers is an Allis-Chalmers HD-15 diesel no-pushbeam bulldozer tractor to do this job in even less time. Another HD-15 diesel tractor with dozer is used on the slag dump to level off the slag heaps and to lift and move railroad track as the dump builds up. Roads throughout the area are maintained by an A-C grader.



New fire-brick is placed on the scaffold with loader mounted on wheel-tractor.

but the tractor operator can go into it to
g chamber.

The slag dump outside the building is worked over by an Allis-Chalmers HD-15 dieselized tractor.



LIGHTHOUSE depends on DIESELS

A CIVIL DEFENSE INSTALLATION



TWO unattended diesel engines are acting as "keepers of the light" 30 miles offshore from Mobile, Ala. Installed on 82-year-old Sand Island Lighthouse, these 5¼-hp Fairbanks-Morse diesels keep a 50,000 candle-power beacon flashing over the waters of the Gulf of Mexico, guiding incoming ships around a dangerous sand bar and into the harbor's main ship channel. Without the unfailing source of power supplied by these engines, the light would go out and every vessel approaching the entrance to the busy harbor would be imperiled. Sand Island Light was formerly manned by a long succession of veteran lighthouse keepers. Since going into operation on January 1, 1954, the two diesels have managed to continue the almost legendary tradition of unfailing dependability established by these veterans. The engines operate alone, starting and stopping automatically, and keep the lighthouse's 54 storage batteries at full charge. The only "supervision" they receive is a monthly visit for inspection by the U. S. Coast Guard.

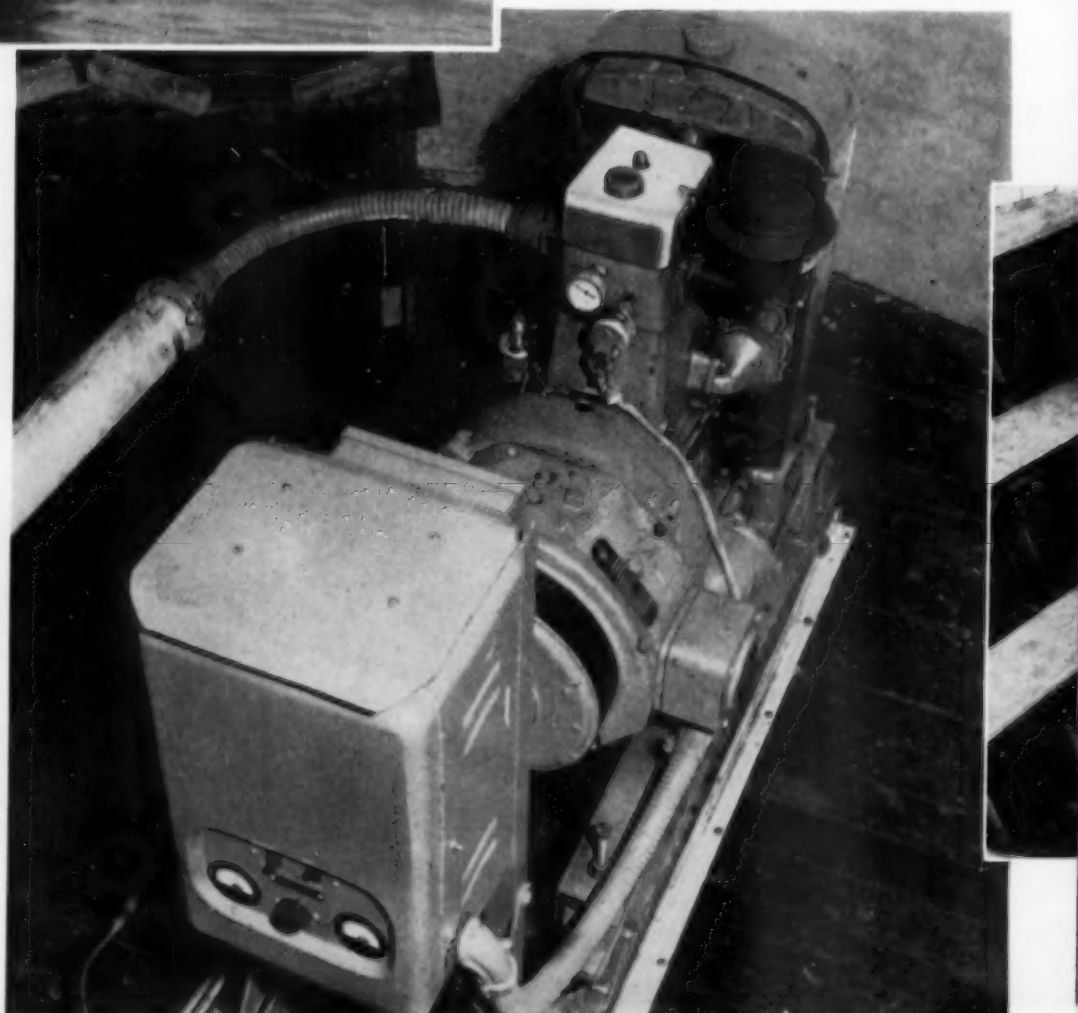
The two diesels are Fairbanks-Morse Model 45B 3¼ E14 units, having single cylinders of 3¼-in. bore and 4-in. stroke. They are rated at 5¼ hp each at 1800 rpm and drive 3½-kw, 125-volt, 31.7 amp dc generators. The drive is direct, through flexible, disc-type couplings. An intricate relay system at the

lighthouse operates the two one-cylinder diesels on alternate schedules. On its appointed night, each engine runs for a period of 10 to 12 hours, until the batteries are fully charged, and then automatically shuts down. The other engine, meanwhile, acts as a standby, ready to pick up the load in the event of an emergency.

Initially, two four-cylinder gasoline engines, driving 2-kw generators, were tried. The hazards of fire and explosion inherent in the use of gasoline fuel, however, were found to be too great. This danger was present not only in the unattended lighthouse, where ventilation presented a problem, but on board the fueling tender, which had to return to Mobile, 30 miles distant, with 20 or more empty, vapor-filled drums. There was danger of fuel spillage on board and also in the use of a motor-driven pump to transfer gasoline to the lighthouse's 1,000-gal. storage tank. Operating economy was also a factor which prompted the Coast Guard to switch from gasoline to diesel engines.

Another important consideration in converting the lighthouse was the age of the structure. The original Sand Island Light was constructed in 1838, almost 120 years ago. The "island" at that time was not an island at all, but a point jutting out into the mouth of the bay from the Alabama shoreline. Gradually, through erosion, this point was washed away and all but the lighthouse's reinforced concrete foundation resting upon 170 untreated piles,

A closeup of the No.1 engine, showing the Fairbanks-Morse control panel, United Specialties air filter, F-M lube oil filter, and Yates-American radiator. The 5¼-hp, 1800-rpm, Model 45B3¼ E14 Fairbanks-Morse, one-cylinder, 3¼ x 4, diesel is direct-connected through a flexible, disc-type clutch to a 3½-kw, 125-volt, 31.7 amp dc generator. Engine is mounted on Korfund Vibro insulator.



90 ft. in length, and on a fill of granite blocks, was submerged. In 82 years of service, both the lighthouse and its foundation have become progressively weaker. The untreated piles are sunk in sand and continued erosion, particularly since the 1906 hurricane, has deepened the channel on the north and east sides. The use of granite blocks as fill has become impractical, since the rock simply slips down into the channel, which is approximately 30 ft. deep. These conditions, plus the manpower and supply problem, helped speed the Coast Guard's decision to convert the lighthouse.

To complicate matters, the Coast Guard hesitated to assign men to this lighthouse, because of the dangers to human life presented by the undermined foundation and by the fact that a hurricane might topple the structure at any time. The answer seemed to be to install modern generating equipment, dependable enough to operate over long periods of time without supervision and without danger of breakdown, and to devise an electrical control system to operate this equipment. Since the two Fairbanks-Morse Model 45B diesel engines were installed, the problem has been effectively solved and, after 120 years, Sand Island Light continues to safeguard human life along the Gulf Coast and to guide ships of all nations into one of the South's busiest harbors.

The control system devised to start and stop the two Fairbanks-Morse diesel engines, and also to protect them while running, is a highly complex one. It includes ten relays, nine of which are arranged in series with the central control relay, which automatically shuts the engines down by cutting off the fuel supply. When an engine is shut down, a reverse current relay opens the charging circuit, thus preventing current from flowing back to the generator from the batteries. To prevent a full load from being placed on a cold engine, an Agastat relay has been installed. This relay maintains a high resistance in the field circuit for four minutes after each engine has been started, permit-

ting the generator to get up to normal operating temperatures before it begins to carry a full load.

At the end of four minutes, the Agastat relay decreases the field resistance and closes the charging circuit. If one of the two diesels should fail to start for any reason within a predetermined period of time, it is automatically shut down by an overcranking relay, which is in series with the control relay. The second engine is then put on the line as a standby. An overspeed relay protects each engine against excessive speed, while an overcurrent relay is actuated when the output of one of the generators exceeds the setting of the overspeed relay. This is accomplished in a rather round-about way. When the overcurrent relay is actuated, it opens the charging circuit, taking all load off the engine. This causes the engine to speed up and trip the overspeed relay, which shuts the unit down through the control relay. This overcurrent relay has to be reset by hand, which means that once it is tripped, the engine will remain shutdown until the Coast Guard makes its next visit. Each engine is protected against high jacket water temperature and low lube oil pressure by a tenth relay, in series with the control relay. When this is tripped, it also has to be reset by hand.

Fuel oil is drawn from the 1,000-gal. storage tank by individual, 1/4-in. motor-driven pumps, powered by the generators not the batteries. It then flows to small service tanks in the base of each unit and passes through filters to the injection pumps and nozzles. As a precaution, the overflow line from the service tank to the storage tank was made larger than the suction line. Lube oil is stored in the crankcase of each unit and is circulated under pressure to the pistons for cooling and to all working surfaces by built-in lube pumps, driven off the end of the governor shafts. The main bearings are also splash lubricated. A non-detergent oil is used and filtering is handled by conventional, cartridge-type filters. Jacket water (2 1/2-gal. capacity) is circulated through each engine by a built-in, engine-

driven circulating pump and is cooled in an induced-draft radiator which forms an integral part of the unit. The radiator fan is v-belted to the crankshaft and maintains the water at an operating temperature of approximately 160°-180°F.

Engine air is supplied to each cylinder through oil-bath type filters, also mounted directly on the engine frame. Exhaust gases are expelled through lines equipped with flexible metal hose and horizontal silencers. An exclusive feature of these Fairbanks-Morse diesels are their Korfund vibro insulators, which support the full weight of each engine and absorb vibration.

With this dependable, precision equipment, Sand Island Light should remain in service for another generation or more, or for as long as brick and mortar can withstand the years. In the sense that it is a self-operating light, Sand Island is one of the most modern on the Gulf Coast, despite the date of its construction. The two diesel engines are making a valuable contribution to Coast Guard efficiency. Most of all, however, they are contributing to the continued safety of ships at sea.

List of Equipment

Engines—Fairbanks, Morse Model 45B3 1/2 E 14, one-cylinder, 3 1/2 X 4, four-cycle, diesel engines rated at 5 1/4-hp at 1800 rpm.

Generators—Fairbanks, Morse Type DGZDJ, 3 1/2 kw, 125-volt, 31.7 amp, direct-current generators, driven directly through flexible, disc-type couplings.

Fuel oil solenoid—Automatic Switch.

Fuel oil injection pumps—DEMCO.

Fuel oil transfer pumps—Autopulse.

Fuel oil filters—Purolator.

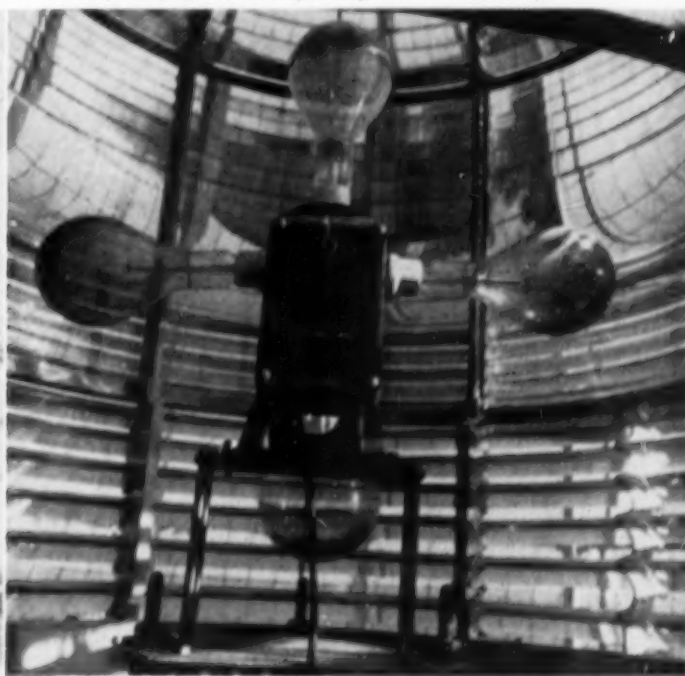
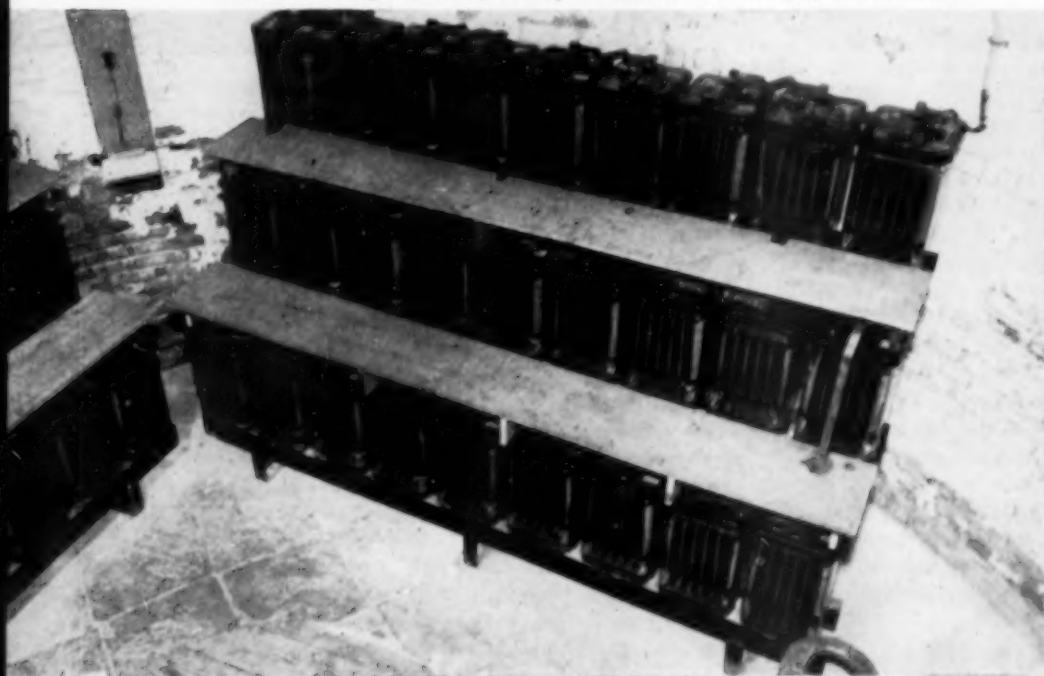
Radiators—Yates-American.

Air-intake filters—United Specialties.

Isolating circuit breakers—Westinghouse.

Batteries—Exide.

In the basement of the lighthouse are the 54 Exide storage batteries, which are kept at full charge by the two Fairbanks-Morse diesel engines. The batteries supply approximately 110 volts, or 2.35 volts per cell. They are inspected and refilled monthly by the Coast Guard.



This Wallace & Tiernan automatic lamp changer has solved the problem of burned out lamps by automatically bringing a new lamp into place when necessary.

DIESEL AND EQUIPMENT INDUSTRY FACE LARGE LOSS IN MARINE SALES UNLESS EXISTING FISH IMPORT SITUATION CORRECTED

By CHAS. F. A. MANN

DUE to the strange workings of our foreign policy laid down after the end of World War II, one of the unique shipbuilding industries of the United States faces virtual extinction. The Puget Sound yards, particularly the highly specialized wood and diesel yards at Tacoma, that have turned out in the past 15 years nearly 1,000 ships of every size from the smallest landing craft and midget minesweepers, to trollers, purse seiners, the largest and most complex tuna clippers ever built, and lastly the largest fleet of non-magnetic minesweepers ever built in one city, \$34,000,000 worth, face a crisis due to the Department of State's insistence we lean over backward and give North Pacific Ocean fisheries over to Japan and let them dump their frozen whole fish into our west coast canneries by the boatload.

In a nutshell, to placate Japan and keep them leaning in the proper direction at the conference table, the huge Pacific coast fisheries centered at Los Angeles, San Diego, the Columbia River and Puget Sound, are being squeezed out of existence. The past year wound up with about 70% of the total poundage of all species of tuna used by Southern California canneries coming from Japan in the form of frozen whole fish by the boatload. This, despite the fact that the tuna clipper fleet has spent a year of limping production, with weeks and months' delays at the docks waiting to be unloaded; four price cuts for the raw frozen fish, and frantic efforts to alarm the Eisenhower government that the huge investment of tuna clippers, the large payroll of fishermen and the financial structure under which these \$350,000 clippers are put together deteriorates daily.

And no new tuna clipper construction in Tacoma yards, long the major building center for the Southern California fleet, for the past four years. The whole tuna fleet is aging rapidly; no new construction and normal losses by accidents and retirements is causing a steady shrinkage. Tacoma at the peak prior to World War II's ending, had 11 boatyards employing around 800 of the highest skilled shipbuilders in the nation. Today there are four yards in active operation with a force of 350 skilled workers, which faces further reduction to 150 within the next four months unless their major peacetime customer, the fishing industry, can be gotten back on its feet.

Editor's Note

The spectacular production of Northwest boatyards for the fishing industry, commercial ship operator and Government has long been one of the amazingly varied and very large markets for every diesel producer and practically every equipment and supply manufacturer throughout the whole U.S.A. The highlights of this record have appeared regularly in DIESEL PROGRESS over the past 15 years. Today, the Northwest boatbuilding industry faces a crisis, in which all their suppliers, engine builders and customers must share the losses, as this industry has its back to the wall.

To make matters worse, the tuna fisheries are not the only branch of the fishing industry that sustained the wood and diesel yards. The same attitude toward throwing open the Pacific fishing industry to Japan, with its low labor costs and huge army of eager fishermen, has also struck the once vast North Pacific salmon industry square in the face. Japan, with huge fleets of mother ships and smaller net boats, is roaming the whole North Pacific ocean, as far as the Gulf of Alaska, and a great drop in all salmon runs in western Alaska streams has suddenly taken place, with the inevitable result in great losses to the trollers and purse seiner fleets, and consequent vanishing of this branch of work for the boatyards, and reduction in the market for diesels and equipment.

Because of the peculiar and potent tie between the Tacoma boatyards which have turned out the majority of the Southern California tuna clipper ships, and the California tuna industry, and the fact that a great many of the California clippers are owned in part or totally by Tacomans, the coastwise aspect of the case, coupled with the great financial ramifications involved, have already alerted Congress, and several hearings of its committees have been held last fall and winter, to lay down the policies necessary to give speedy relief to this situation. Never before in west coast history has competition of foreign raw fish been the cause of a situation that prevails today. Excerpts from the testimony given by the American Tuna Boat Association before the Senate Interstate and

Foreign Commerce Committee hearing in November tell the glaring realities that bring on this crisis:

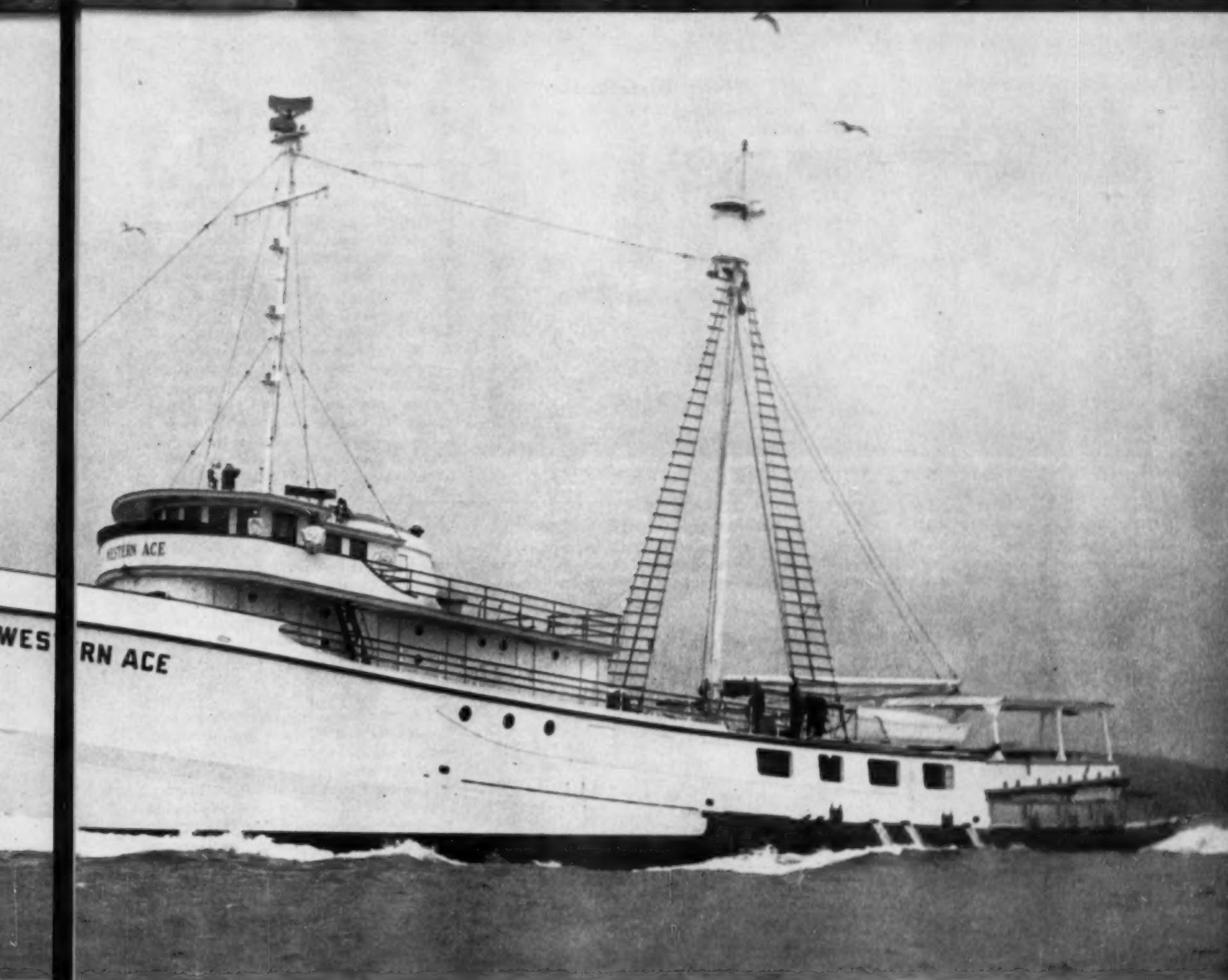
1. In 1948 approximately 9,000,000 lbs. of frozen tuna were imported from Japan. In 1955 it will almost hit 170,000,000 lbs. or more than 70% of all tuna canned in Southern California canneries.

The domestic tuna fishing industry cannot exist one more season on a mere 30% of the total raw fish market.

2. These figures are more striking in the face of an actual decline in imports of Japanese canned tuna that by-passes American canneries as well as American tuna fishermen.

3. The picture grows more complex when one considers the tremendous annual increase in canned tuna consumption by the U.S. market. The present rate of growth indicates that if all Jap-





The *Western Ace*, typical of the highly specialized and complex tuna clippers built in the Pacific coast yards.

anese tuna, both canned and frozen raw for processing in California plants were stopped, the wood and diesel shipbuilding industry would have to construct over 100 giant size clippers with from 3 to 6 diesel engines each, and costing an average of \$400,000 apiece at today's market prices for materials, equipment and labor, just to catch up with delayed replacements and added capacity of the fleet to produce raw fish enough to supply today's high and constantly rising demand for canned tuna products!

4. Employment in the tuna fleet is down to an even 2,000. When one considers that the average annual income of every tuna fisherman and officer, under the complex share system, exceeds \$12,000 per man, the magnitude of the effect on the economy of the west coast grows more striking.

5. Profits on sales of American caught tuna are down to one-tenth of what they were in 1948. So they buy no new diesels or no new ships.

Basically it is a simple question of our do-good global foreign policy already wrecking one of America's and the world's unique and highly mechanized industries. All it takes is a drastic percentage limit on imports of Japanese frozen tuna—a limit to the gross annual consumption in the U.S.A. that can be imported from Japan or anywhere else, on a fixed percentage basis, so our own complex tuna fisheries and shipbuilding industry can survive and maintain its pool of skilled talent, the finest on earth, and the outlets for the fantastic line of equipment and engines it uses, open.

Forty million dollars worth of shipyard and equip-

ment orders can go on the books in 90 days if Congress will shut off Japanese raw tuna imports. Another fifteen million of the same type of shipyard orders will go on the books in four months if Japanese fisheries are pushed back 700 miles from the Alaska coastal waters. Meanwhile, the Tacoma Shipyard Association, the solid core of the building industry of the Northwest, have banded together and launched a campaign to alert all components of the complex fishing, shipyard, diesel engine and equipment industries to unite and tell Congress this month they will not sit idly by and let international politics ruin a great industry with national ramifications in 300 industries, besides the basic shipyard and fishermen's own payrolls which have helped build the whole west coast.

Here is a call to the diesel and allied industries to save a portion of its great market by direct appeal to every Congressman and Senator.

Visits Distributor

S. E. Knudsen, general manager of the Detroit Diesel Division of General Motors Corporation,

was in Houston late last year as the guest of Stewart & Stevenson Services, Inc., the nation's largest

distributor of GM diesel engines. His visit was the first time that a general manager of this division visited Houston or Texas. During Mr. Knudsen's stay he was conducted on a tour of Stewart & Stevenson and various other leading Gulf Coast industries by Ross Stewart, president, and Joe Manning, vice president of Stewart & Stevenson. He was shown some of the outstanding and unusual applications of diesel engines that Stewart & Stevenson engineers have made in this area.

Mr. Knudsen is the son of the late William S. Knudsen, president of General Motors from 1937 to 1940. He was named general manager of the Detroit Diesel Division March 1, 1955. He was manufacturing manager for aircraft engine operations of GM's Allison Division before going to Detroit. Mr. Knudsen joined General Motors as a process engineer at Pontiac Motor Division three years after graduating from Massachusetts Institute of Technology.



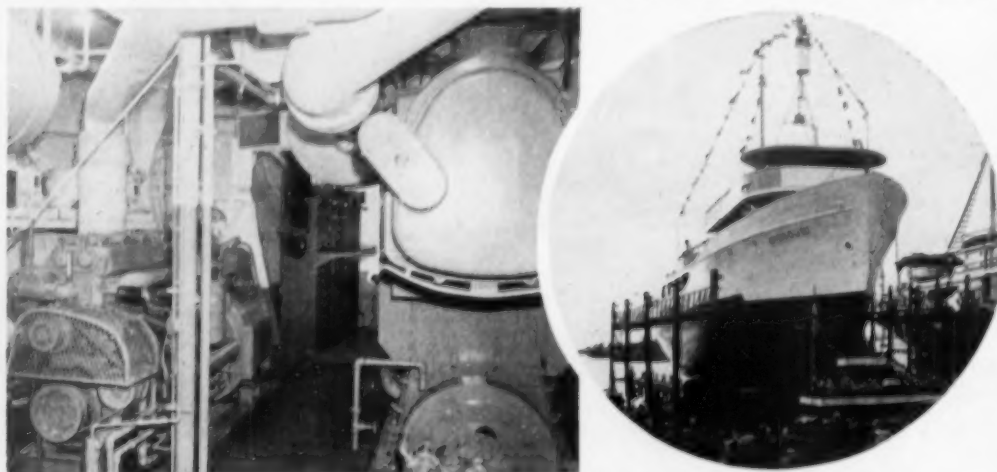
Left to right: Mr. L. O. Carlson, Mr. Ringo, Mr. Joe Manning, Mr. S. E. Knudsen, Mr. Don Stevenson, and Mr. C. Jim Stewart.

Launches Tuna Clipper

Latest addition to San Diego's tuna fleet slides down the ways at the National Steel and Shipbuilding Corporation. Christened the *Missouri*, it

is the fifth in a series of 127 ft. high speed, welded steel tuna clippers designed and developed by this concern specifically for the western fishing indus-

try. Mdmes, Earl L. Combest and Harry L. Robinson served as sponsor and matron of honor at the ceremonies. Principal speakers included Mr. C. Arnholt Smith, president of National Steel, Mr. John Bate, San Diego Port Director, and Captain Loren H. Seeger, Commanding Officer, San Diego Coast Guard Group.



The tuna clipper *Missouri* just before launching and (left) view of the engine room showing the F-M OP engine to the right and the Murphy auxiliary engines with Electric Machinery generator.

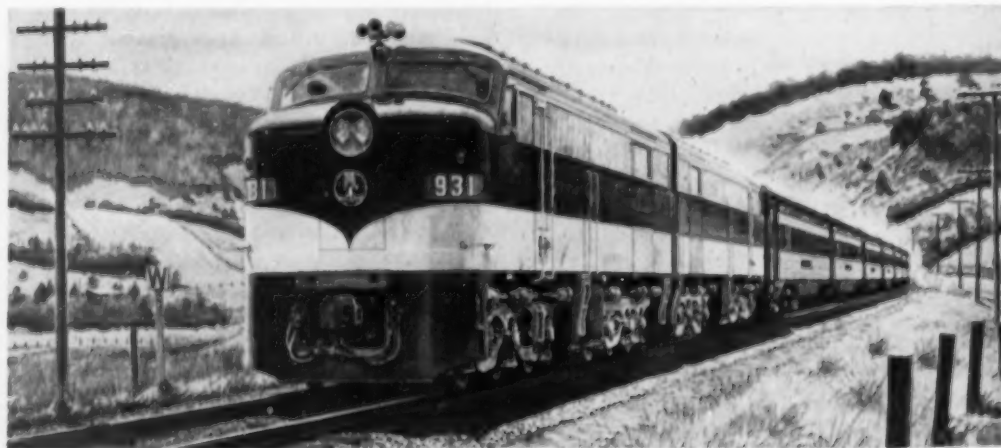
The main propulsion for the *Missouri* is supplied by a Fairbanks Morse Model 38D8 opposed piston diesel engine rated 960 hp at 720 rpm. Auxiliary power is furnished by two Model 24 6 cyl. Murphy diesel engines, each developing 191 hp at 1200 rpm. The generator is an Electric Machinery 125 kw unit. The 340 ton class hull was developed by National Steel and tested in the University of Michigan test basin to insure its efficiency of line and detail. The fluid design of this vessel made possible a recent 43-day trip by a sister ship of the *Missouri*. Electronic sounding equipment and long range radar are provided in keeping with the latest developments in scientific fishing.

Alco Locomotive Built "Down Under"

Delivery of its first diesel locomotive built in Australia has been announced by Alco Products, Inc. Fabricated by A. E. Goodwin, Limited of Sydney, the new unit was constructed under terms of a licensing agreement which Alco had negotiated

with the Australian firm in 1954. The new locomotive was delivered ahead of schedule and is the first of six ordered by the South Australian Railways. A 1600-hp, streamlined diesel, the unit is the World Locomotive-type which Alco designed espe-

cially for overseas service. The World Locomotive is powered by a 1600-hp diesel engine and combines all of the advantages of mass-produced components with the addition of braking, coupling and other equipment adapted to foreign standards. It is designed to meet the requirements of international clearances, and can be built to operate on every track gauge found in the world ranging from one meter—the narrowest, to 5 ft. 6 in.—the widest. Alco's World Locomotives also have been sold to railroads in Spain and Pakistan.



Under the terms of the licensing agreement, Alco built the diesel engines for the Australian locomotives at its Auburn, N.Y. plant. All other major components have been fabricated "down under" with the help of a team of Alco production experts led by Stephen Angle of Schenectady. Upon delivery, the South Australian Railways pressed its first new World Locomotive into high speed passenger and freight service.

Caribbean Sea Truck

A sea truck will soon be introduced into Caribbean shipping service by T. M. T. Trailer Ferry Co. of Miami, Florida. The revolutionary craft will be put into service between Puerto Rico and the Virgin Islands.

Built by the Blount Marine Corp. of Warren, Rhode Island, this experimental vessel is the latest of a new type of craft designed to speed freight on land and water trips. It will be able to carry three 20 ton loaded trailers. Loaded, the all-steel 64 ft. vessel will draw about 8 ft. and displace 130 tons. A model 6-110 General Motors diesel rated 240 hp. will drive it at about 8 knots. For longer runs, larger Sea Trucks with twin screws will be used.



Arabian Power Plant

The so-called open-air design of power generating plant, often used in favorable climates, came in for unexpected use in Saudi Arabia, according to a story brought back by representatives of Enterprise Engine & Machinery Co., and Michael Baker, Jr., Inc., consulting engineers. When Baker's construction of the Nasrieh power plant in Riyadh was unavoidably slowed for nearly a year, two Enterprise diesels for the plant went to work on schedule, right out in the open, driving a pair of 1,375 kva Elliott generators.

Meeting the engine in-service dates proved to be the easiest part of the job. Unit No. 1, for example, stood completely in the open for three months during assembly and connection of auxiliary equipment. And it operated in much that same situation for a full five months afterward, with only a roof provided. Total enclosure wasn't possible for another four months, making a whole year that the engine filled its role as Saudi Arabia's first open-air generating plant.

The biggest hazard during this time was the characteristic windstorms, or "shamals," of Arabia. With these winds the fine desert sands invaded every opening, corner, and pocket, requiring constant cleanup of all equipment. To make matters worse, the weather was extremely hot. To the credit of everyone concerned, the American-made diesels and their auxiliary equipment came through with flying colors.

Along with the Enterprise engines and Alco coolers, the plant is equipped with two 1,375-kva Elliott generators and 20-kw Elliott belt-driven exciter units. Ross 1011 CP lube oil coolers, Briggs JP4-DV2 lube oil filters and Vortex LB 50-16 oil bath air filters complete the major auxiliaries. Tut-till oil pumps and Ingersoll-Rand water pumps are in the system.

Representing the Saudi Arabian government, John Hungerbuhler, a Swiss, is chief engineer of the royal power station. Michael Baker, Jr., Inc., engineers of Rochester, Pennsylvania, designed and built the power plant, with electrical equipment under the jurisdiction of Ray Budnik. Enterprise Engine & Machinery Co., San Francisco, was represented by Jan van den Berg, service engineer.



Two Enterprise diesels, surrounded by idle materials and equipment, stand alone at the Nasrieh power plant site in Riyadh, Saudi Arabia. This was the fall of 1952, and the builders, Michael Baker, Jr., Inc., of Rochester, Pennsylvania, were dogged by unforeseen delays. Unit No. 1 (at left) met its scheduled completion date and operated for nine months afterwards without full enclosure.

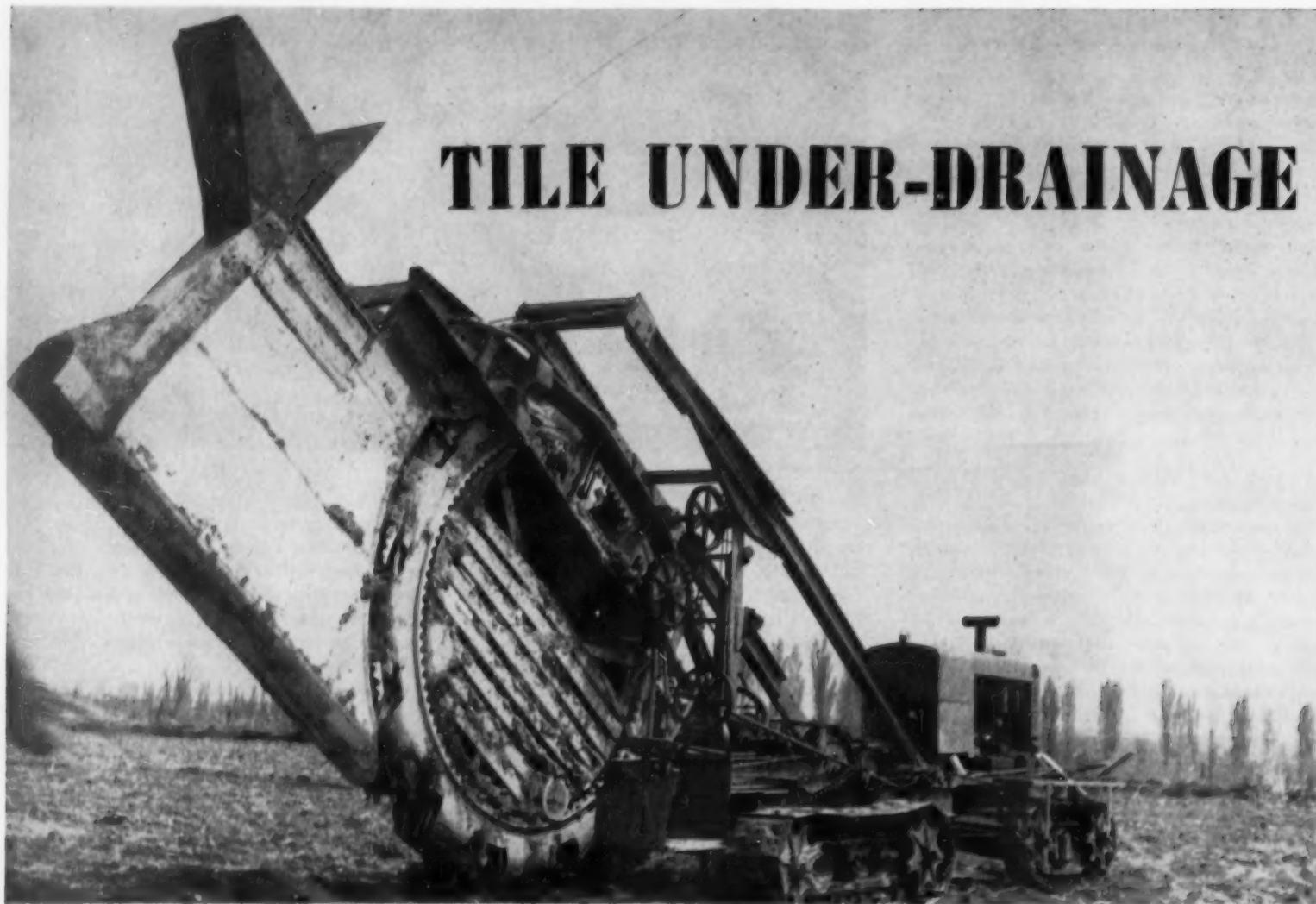
West Indies Shrimper

Another shrimp trawler for the blue waters of the Caribbean Sea, *Mr. Andy* is the last word in in-shore wood trawlers built by Riverside Boat Works on the banks of the Miami River. This 38 by 11 ft. vessel was recently delivered to Dr. Pastor Laguerela of Palmer Food Products, Havana, Cuba.

Powered with a DIXEC 6 cyl. Hercules marine diesel rated 115 hp at 3000 rpm and Paragon r&r gears which turns a Columbian bronze 22x18 propeller. A Twin Disc power take-off supplies power for the trawl hoist. Equipped with all the conveniences and safety devices, she is now operating off the Cuban coast. *Mr. Andy* was packaged by Auto Marine Engineers of Miami, Florida.



TILE UNDER-DRAINAGE



Right side view of nearly automatic ditching machine or often called "wheel type trenching machine" which excavates trench and lays pipe to proper grade and alignment together with pressure-testing pipe and applying filter gravel all in one operation.

LIKE some prehistoric monster lumbering across the Utah landscape, a unique dieselized unit has been doing a fine job of providing tile underdrainage to farm lands. The track-type machine is powered by a Model HRIP-600 Cummins diesel through a Twin Disc clutch. Developed by Sumner G. Margetts of Salt Lake City, Utah, the machine does a combined job of trenching, laying pipe or tile and applying a filter gravel.

Machine in operation. Four men are required to operate machine. The man standing on machine operates levers to keep it on line and grade. The man leaning over the crib has handed pipe to the tile layer in cage (not visible) and operates pressure system lever. The man on small tractor keeps the chute filled with filter gravel. Note sides of trench caving off (quick sand finning in) behind cage.



Most of the leading farm areas in both Utah and Idaho that have become unproductive because of high water table and alkaline soil conditions can be successfully reclaimed with tile underdrainage by means of this especially constructed machine.

Under ordinary circumstances much of this land would be abandoned. The unit is capable of installing an average footage of 1000 feet per day.

This includes the complete job of excavation of trench, laying a pipe or tile to grade and in alignment with a 4-in. gravel filter over, under and around the pipe.

The machine consists of a 12-ft. diameter excavating wheel which is caged in. A steel box or crib immediately behind the excavating wheel is where the tile layer works. A hydraulic plunger or ram in the steel crib pushes the pipe together for fit and alignment. The plunger or ram has a two-fold purpose of eliminating the chance of laying faulty pipe and fitting the pipe together so it is aligned and not out of grade. A chute attached behind the steel box is for filter gravel and feeds the gravel evenly over, under and around the pipe laid.

Tile drainage provides definite advantages in the productivity of farm lands. Excess water which would ordinarily erode topsoil is drained harmlessly away. Because the water is removed, the growing season is extended. Faster germination of seeds is encouraged because dry soil is warmer than wet earth. Fertilizer is not washed away and, because roots must go deeper for water, plants are more drought resistant. The need for tile underdrainage is more urgent wherever water stands in fields for any length of time or where the water table is 2 or 4 feet from the surface and on all agricultural land having clay or unstable subsoil.

MOBILE GENERATOR PLANT

A mobile 500-kw diesel-electric generator plant recently was delivered by A. G. Schoonmaker Co., Inc., to the Northwestern Public Utilities Co., Huron S. Dak. The travelling power plant was built up at the Sausalito, Calif., factory of the Schoonmaker organization which also has an establishment in New York.

The January 1951 issue of DIESEL PROGRESS printed a feature article about an 1100-kw portable Schoonmaker plant. Since that time the company has manufactured and sold more than 30 of these units. Diesel engines used are completely rebuilt in the Schoonmaker shops. The successful operation of these plants speaks well for both the long-life characteristics of the engines and the skill of the men who rebuild them and engineer their installation into highly useful and valuable power sources. Diesel engines remanufactured by Schoonmaker also are sold for marine service, their western plant being located on San Francisco Bay.

The South Dakota utility which purchased the electric plant shown here in pictures will use it to insure service to the many communities in its system. While it will be available for emergency calls, its primary function will be to stabilize voltage at the end of long feeder lines, thus minimizing voltage drop. It also will be used frequently while repair and expansion work is in progress on transmission lines.

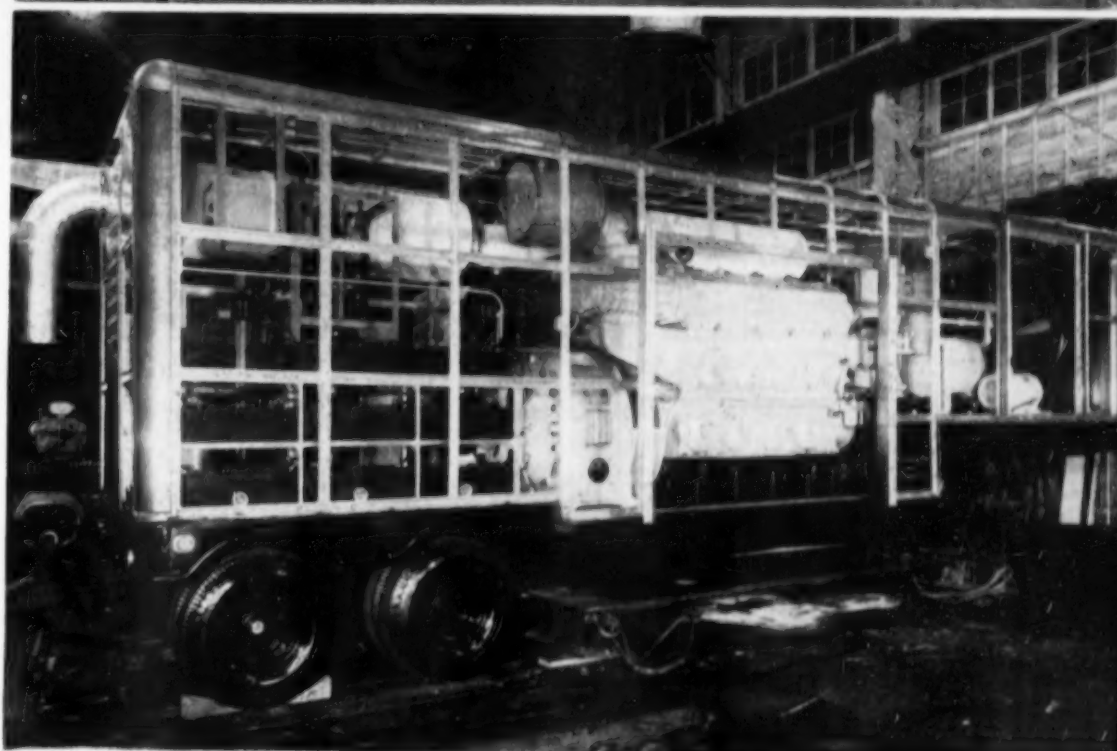
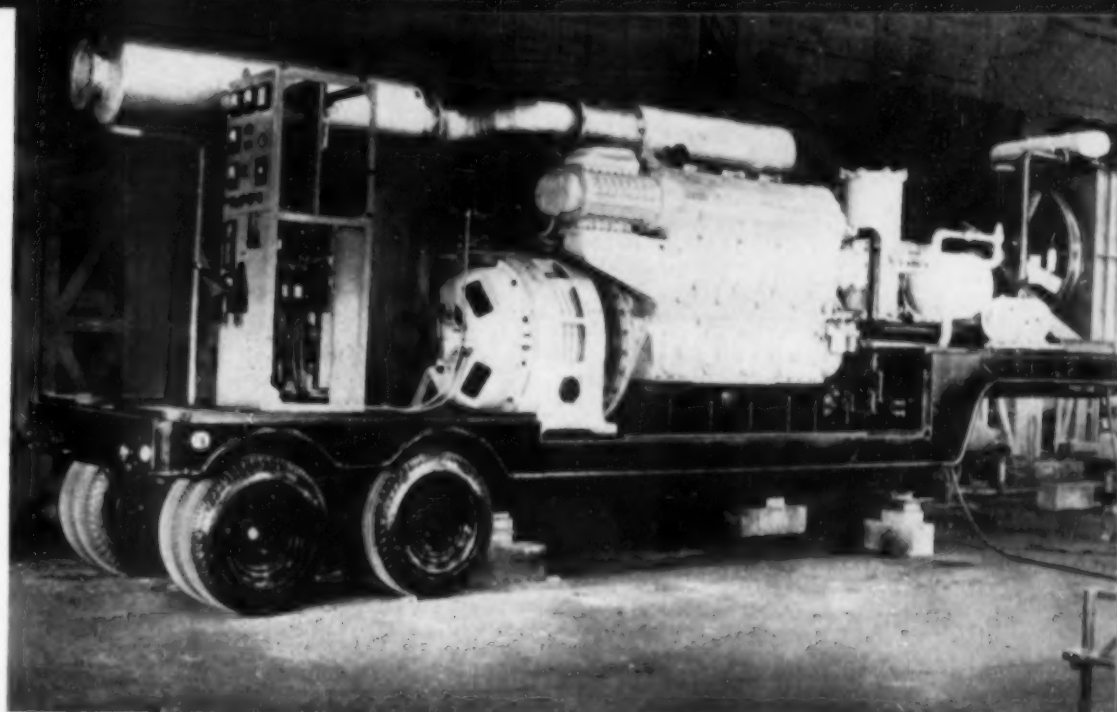
Harry C. Elliott, vice president for engineering and production, designed the unit. It is powered by a Model 8-567A Cleveland GMC diesel rated at 720 bhp at 720 rpm. It turns a 500-kw, 625-kva General Electric generator and its governor is a Marquette B-135. The switchboard was provided by Mullenbach Electric and the radiator by Young Radiator Co. Although designed by Schoonmaker, the trailer was built by Yuba Manufacturing Co.

Among the more interesting construction details are these: Four jacks were designed for leveling the plant while it operates; A Thomas coupling was designed into the unit to maintain alignment and to eliminate torsional critical problems; A built-in fuel tank holds 500 gal.; A 2-way switch allows unit lighting by either the 64-v dc starting battery or by normal source of 110-v ac; A 20-kva transformer provides 2300/240/120 volt for auxiliaries and can be operated from a transmission line when the diesel is shut down or from the diesel set.

Top—It is at this stage of construction that the mobile unit is run in on the factory's test stand.

Middle—Framework for the trailer housing the plant is added.

Lower—The complete mobile power plant, ready for delivery to the purchaser in Huron, S. Dak., photographed outside the Schoonmaker plant at Sausalito, Calif.





AUTOMOTIVE DIESEL PROGRESS

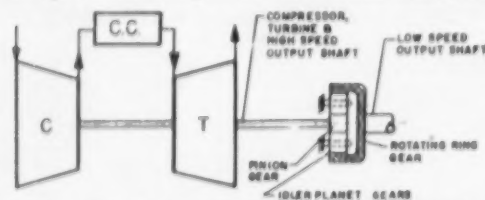
A COMMENTARY BY MERRILL C. HORINE

Merrill C. Horine, for 38 years a member of the Society of Automotive Engineers, has been actively engaged in automotive engineering, sales promotion and training, advertising and editing of automotive publications since 1907. He has contributed numerous papers on diesel and allied subjects to the SAE and other organizations. An officer in the Air Service in World War I, he was a consultant to the Chief of Ordnance and the Automotive Division of the War Production Board in World War II.

THE DIFFERENTIAL GAS TURBINE

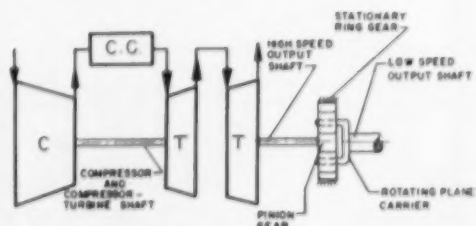
GAS turbines, while not in any sense diesel engines, are of interest to the diesel world because they, like diesels, burn low-grade fuels and may, in the course of time, attain thermal efficiency superior to gasoline engines. One move in this direction which shows considerable promise from the standpoints of flexibility and improved economy is the Differential gas turbine. Under development by the Turbex Corp. of Mamaroneck, N.Y., the new engine offers particular possibilities for application to road vehicles.

Previous types of gas turbines drive their compressors either from the output shaft or have separate turbines to drive the compressor and the output shaft respectively. In the Differential gas turbine, there is a differential gear between the two, the spider of which is driven by the turbine. This permits the compressor and drive to turn at different speeds, according to the needs of the situation.



In the single shaft type, whether driven by a single turbine or by compound turbines, the greater the load on the output shaft and consequently the slower its speed, the slower the compressor speed and hence its output tends to be reduced at the very time when an increased volume and pressure of air may be needed.

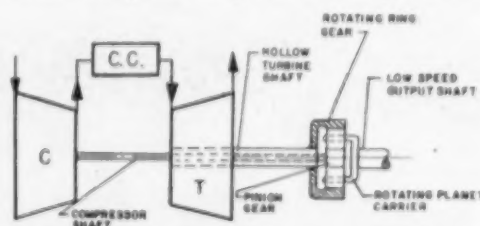
Under light loads, conversely, the turbine speed rises, unless checked by the fuel control and with it the speed and output of the compressor, with consequent waste of energy. In the dual-shaft, dual-turbine type, this difficulty is overcome to some extent, but not entirely and the use of two turbines lowers the efficiency materially. It will readily be apparent that as the load on the output in-



creases, the drive turbine will slow down and the reaction of the gases leaving the compressor turbine will serve to increase the speed of the compressor turbine somewhat, thus permitting it to increase the output of the compressor when increased air delivery is required. But the tendency to deliver too much air at light load remains. Such an engine might conceivably idle while connected with the load, which is highly desirable.

These older types, although admirably suited to more or less constant-load service, as in aircraft, marine service and certain stationary applications, lack the flexibility demanded in vehicular service. The single-shaft type in particular shows poor accelerative ability and slow-speed operation. It is also unable to idle while connected with the load.

By the use of the differential drive from the single turbine to separate compressor and output shafts,

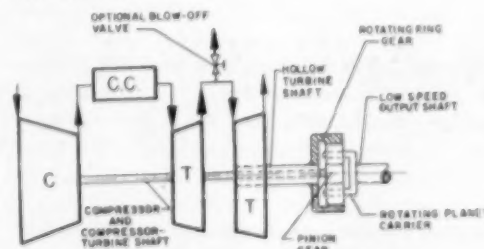


the relative speeds of the two will vary automatically according to load. When the load is great, the drive shaft will slow down, with an increase in torque, while the compressor side will speed up, thus supplying increased air delivery to support the efficient combustion of greater fuel input. Like-

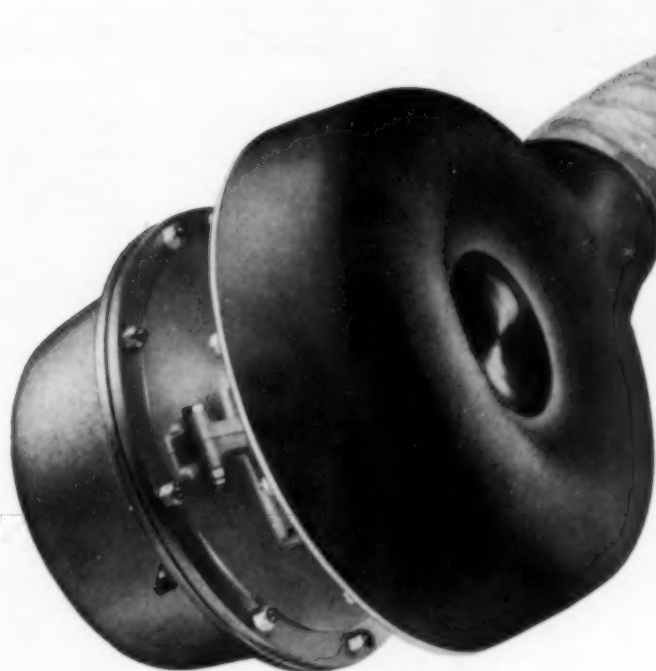
wise at light loads, the drive side will tend to increase in speed, while the compressor side correspondingly slows down, permitting the turbine to operate on less fuel and with less air, at slower speed. Both are in the interests of economy.

Aside from this simple basic principle, the Differential turbine, as developed by the Turbex Corp., incorporate an over-running clutch, for some applications, by which the compressor may be restrained from turning at a slower speed than the output shaft, for high-speed, low-torque operating characteristics. Thus coupled, furthermore, the compressor can be made to contribute retardation when coasting or drifting, instead of permitting the vehicle to free-wheel. This will not only contribute to safety; but will relieve the wheel brakes of a part of their duty.

By appropriate design, the differential may be arranged to impart a bias of speed either toward the compressor or the output shaft, to endow the engine with the desired torque-to-speed characteristics which the individual application requires. The illustration below shows an elaboration of the differential principle, employing two turbines but retaining the differential drive from the low-pressure turbine.



Claims for drastic reduction in part-load fuel consumption and liveliness in acceleration appear to have a sound theoretical basis. Starting, too, would seem to be facilitated by the fact that the compressor may be spun with the turbine stationary, as with the two-shaft, two-turbine type.



MORE DRIVE

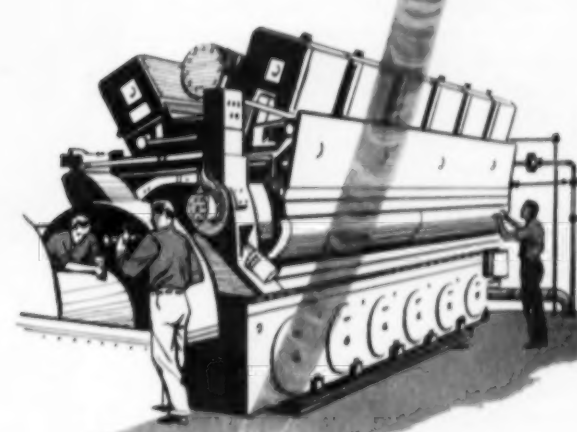
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AiResearch is the largest producer of small turbomachinery in the United States. Twenty-five *million* hours of experience in deriving exceptional power from small units is the background for the development of the AiResearch Turbocharger. This power package was recently applied to earth-moving diesel equipment with startlingly effective results.

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The shrimp *American Beauty* launched in Corpus Christi was Shrimper Hull No. 1 for Consolidated Shipyard, Inc.

Loven Manuel, general superintendent of Consolidated Shipyard, Inc., and designer of the *American Beauty* is shown here with the ship's main power plant—a General Motors 6-110 diesel supplied by Stewart and Stevenson Services of Corpus Christi.

CORPUS CHRISTI SHRIMPER

LAUNCHED in Corpus Christi, Texas in July was the dieselized shrimp, *American Beauty*, built for P. W. Curry of Austin, Texas by Consolidated Shipyard, Inc. The craft was the first to be built by Consolidated and the first of its size to be built in Corpus Christi in recent years. Designed by Loven Manuel, Consolidated's general superintendent, the craft is 75 ft. in length, has a beam of 23 ft. and a draft of 6½ ft. She has a payload capacity of approximately 50 tons, and, according to Mr. Curry has the size, power and cruising radius to go wherever shrimping is good.

Her deck house is constructed throughout of Philippine mahogany and in addition to the pilot house contains a galley which would be a credit to any luxury yacht. Also located in the deck house are bunks for a crew of six, lavatories and shower baths. Propulsion power is supplied by a General Motors 6-110 Diesel engine turning a 50 x 44 Columbian 4-blade wheel through 4½-to-1 reduction. The craft is equipped with Morse controls, a GE ship-to-shore telephone and Raytheon fathometer. Electric power is furnished by a 2½ kw. Onan diesel generator set. Winch and pumps are operated by power taken from the front of the propulsion engine.



At the launching were: (Left to right)—Mr. and Mrs. P. W. Curry, Jimmy Storm, John Mitchell, E. J. Patterson, N. N. Elkin, Loven Manuel, Harvey Langston, and Billy Pugh.

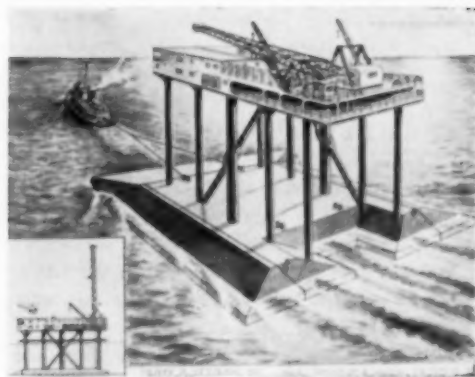


Monel metal fastenings are used throughout the keel assembly of the vessel.

Present at the launching ceremonies, at which Mrs. Curry did the honors before an audience of over 100 spectators, were Mr. Curry, Jimmy Storm, Glasscock Drilling Company; Billy Pugh, president of Consolidated Shipyards; Loven Manuel, designer; and representatives of the Detroit Diesel Engine Division of General Motors and Stewart and Stevenson Services of Corpus Christi who supplied the propulsion power. Other suppliers represented were the Empire Dock and Boat Company and the San Antonio Machine and Supply Co.

The craft's sister ship, the *Gulf Star*, built for Troy V. Hardin, Corpus Christi, by Consolidated also was to be launched in August. The *American Beauty* is Mr. Curry's second shrimp. Under command of Capt. Charles Bower, the craft made her first trip in August.

Portable Offshore Drilling Unit



Avondale Marine Ways, Inc., of New Orleans has received a contract from Delta Offshore Drilling Company for a portable, submersible, self-stabilizing, elevated deck drilling vessel for service in the Gulf. This contract brings to four, the number of such units now being built by Avondale to the same basic design. The new vessel, generally similar to several which are in operation or are being built for various owners, was designed by Friede and Goldman, Inc., naval architects and marine engineers of New Orleans, in accordance with their previously developed and established principles for such service. It will be built to applicable requirements of the U.S. Coast Guard and the A.B.S.

The new unit has been designed to operate in the open sea in water 25 ft. deep, and in greater depths when in more protected waters nearer shore. It consists essentially of a slotted hull with an elevated drilling deck, supported by fixed columns. Lowering and raising of the hull is effected hydraulically. Stability during lowering and raising operations is maintained by four pontoons, nested in the bottom, which are actuated by hydraulically operated rams. The hull is of anti-scouring design, but has provision for proper towing efficiency and speed.

This vessel will support a 1,000,000 pound lift derrick, all necessary drilling machinery and equipment, which is powered by three Alco 850 hp Model 251-B main engines. A 60 kw GM diesel generating set Model 6031-C is also provided. Facilities also include a helicopter landing deck and air-conditioned quarters for 32 men.

C-B Advancement



David M. Salls

The appointment of David M. Salls as home office manager of the Gas and Oil Industry Sales Engineering Section has been announced by R. F. Lay, vice president and sales manager of the Cooper-Bessemer Corporation, Mount Vernon, Ohio. In his new position, Mr. Salls will be responsible for coordinating the efforts of the home office engineering group directly supporting Cooper-Bessemer's field sales activities in the oil and gas industries, according to Mr. Lay. With the rapid expansion in the oil and gas industries there has been a growing need for spe-

cialized contact between factory engineering and field service, Mr. Lay points out. Creating the new position now served by Mr. Salls effects better coverage of the industry's needs for special equipment, for economic and system studies as well as equipment and station layout.

Mr. Salls is a registered professional engineer in Ohio and a member of the American Society of Mechanical Engineers. In addition to his general assignments of engineering V-angle compressors for pipeline and refining use, Mr. Salls will direct the application of Cooper-Bessemer's newest Type FMP compressors for pick-up and air drilling service.

South African Engineer



Roderick J. Ironside, diesel engineer (center), is pictured in Detroit Diesel's service training school prior to his 9000-mile journey back to his home in South Africa. With Mr. Ironside is Harold Vaughn, director of Detroit Diesel's service training school (left) and A. T. Baynes, manager of the Division's special activities.

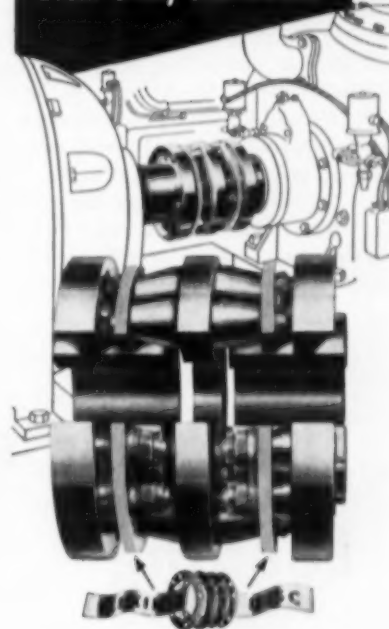
Crossing jungle rivers by means of insecure tree-branch bridges, riding dug-out canoes and battling almost impassable terrain during tropical rainstorms are still difficulties to be met by diesel servicemen in certain sections of Southern Africa. Roderick J. Ironside, diesel engineer from the Union of South Africa who has had many of these experiences, recently completed a five-week course in Detroit Diesel Engine Division's service training school.

Through the service department of the Power and Industrial Division of General Motors in South Africa and its dealer organization, Mr. Ironside is responsible for servicing General Motors diesel engines in an area equal to two thirds that of the United States. Fortunately it is only in a small portion of this territory that transportation difficulties are encountered. Mr. Ironside is also in charge of a diesel service training school at General Motors South African (PTY) Limited at Port Elizabeth.

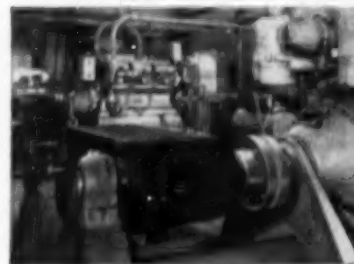
Mr. Ironside spent three months in the United States visiting Detroit Diesel and other General Motors engine divisions. He left the country in December on his 9000-mile long journey back to South America.

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DISTINCTIVE ADVANTAGES

FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



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WARREN, PENNSYLVANIA, U.S.A.

Eastern Diesel Observations

By A. B. Newell

ONE OF THE SIGNIFICANT moves in construction of floating equipment for the railroads is the order placed by the D L & W for five diesel-electric tugs of standardized design for use on New York Harbor. This is the final phase of a railroad program of industry wide standardization. The tug design was approved for all railroads by the General Managers Association of New York in order to provide more efficient and economical freight service. The construction contract was placed with the Bethlehem Steel Company's Staten

Island Shipyard for the five ultra modern vessels 105 ft. long, 26 ft. beam and 13 ft. 8 in. depth of hull amidships. The engines are the General Motors Cleveland Diesel Engine Division's recently developed turbocharged diesels of 8-cylinder v-type rated 1400 hp each. There is an estimated railroad fleet of 1500 tugs, barges, scows, carfloats and other craft all to be of a single standard design in a manner similar to that of freight cars. The more recently built carfloats, etc., have been standardized and now diesel tug construction is following along similar lines.

FAIRBANKS MORSE model 38 O-P diesels will power the two locomotives on a new Talgo train for the New Haven Railroad.

ON THE Saint Lawrence Seaway project over 200 pieces of earth-moving equipment are powered by Cummins diesels. Included are a number of Mississippi Road Machinery Company scrapers driven by Cummins 400 hp V-type engines.

EARLY IN JANUARY the Mack Manufacturing Company was scheduled to deliver 12 of the 24 Alaskan Freightways trucks, or tractors for what is called the La Tourneau Freight movement. Each of the trucks is powered by a 600 hp turbocharged, V-type Cummins diesel. Delivery of the last 12 is scheduled for March. This is an Air Force contract. Prior to the design, building and demonstration of a unit of this kind for Victor Gazzi, President of Alaska Freightways, almost insurmountable difficulty had been encountered in the movement of personnel and heavy supplies such as steel and cement to new air bases and radar stations. The problem seems ready to be solved with Mack's delivery of the 24 units with a total of 14,400 hp under the hood.

THE 1600 hp tug *Barney Turecamo* was delivered early in January to the Turecamo Towing Company of Brooklyn, New York by the builders, Jakobson Shipyard of Oyster Bay, Long Island. This is a modern, all welded steel vessel 95 ft. long to Marrit Demerest design. The earlier four diesel tugs in the Turecamo fleet are also powered by diesels manufactured by the Cleveland Diesel Division of General Motors.

THE DIESEL industry is feeling the impact of the St. Lawrence Seaway project for most of the equipment used on both sides of the border comes from the USA. In addition, however, there is a decided increase in activities on the Great Lakes as for example in tugboat building. This seems very obviously to be a movement in anticipation of more water borne commerce on the lakes.

WITH A HIGH concentration in New York City of the export divisions of the various diesel manufacturers, we find in visiting these divisions that a great upswing in diesel exports is being felt. Dollar exchange is plentiful abroad and payments are prompt. For example, in Southern Peru the American Smelting Company will build a whole city for the new development of copper mining.

HIGGINS, INC. of New Orleans has taken a contract to build ten seismograph survey craft for a Brazilian exploration company. Seven of these will be 52 footers and three will be 58 ft. long. They will be powered by General Motors, Detroit, Model 6-110 diesels and will be very similar to the *Captain Jack*, a survey boat for the Corps of Engineers. With a beam of 15 ft. 7½ in. and maximum draft loaded of 3 ft. 10 in. the *Captain Jack* was designed to make 22 mph loaded. She cruises at 18 mph. Of welded steel construction, the vessel has a forward cabin, a bridge house with engine compartment below and an after cabin to accommodate 6 persons, including sleeping quarters. The GM diesels are under pilot house control. The latest types of communication, depth finding and radar equipment are installed. Still in hand are hulls No. 209 and 210 of the Halliburton fleet extensively described in the November issue of DIESEL PROGRESS.

The World's Leading Manufacturers of FUEL INJECTION EQUIPMENT for Diesel Engines



Depots and Service Agents in over 100 Countries.

C.A.V. DIVISION OF LUCAS ELECTRICAL SERVICES INC., 653 TENTH AVENUE, NEW YORK, 36, N.Y.

Sales Office: 14820 DETROIT AVENUE, CLEVELAND, 7, OHIO.

AP 174-754

THE NEW ENGLAND Thruway construction is now calling for new earthmoving equipment in large amounts.

IT IS REPORTED that the Military Academy of West Point will be giving a special course of instruction in diesels in about another year. Meanwhile the Ordnance Laboratory has a cutaway engine and a new General Motors engine, referred to by the Academy as a "G.M.C.," is being put into operation on a dynamometer for purposes of instruction.

THE BLOUNT Marine Corporation of Warren, R.I., has several diesel boats under construction and on order. Two of these are 50 ft. tugs for the Grace Line to be powered by General Motors Series 110 diesels, for use in South America. Also for Latin American service is a river type towboat with twin screws. An oil barge is building for New Bedford service with a pair of GM 4-71 engines and a 64 ft. party fishing boat for Gallile Marine Enterprises will be powered by twin Harnischfeger 4-cylinder diesels. Particulars are to be released shortly regarding another diesel equipped drill boat to be turned out by this yard.

LAST YEAR'S devastating floods in Connecticut have resulted in the sale of numerous emergency electric generating sets according to Diesel Sales Company, Inc. of Danbury. Some 30 Kohler gasoline engine driven generator units ranging from 5 to 15 kw were sold last fall for stand-by power in business establishments, factories, institutions, etc. At the same time a pair of 40 kw Kohler diesel units were sold for use on a large estate near Ridgefield.

THE SMALL PETTER diesels have gone over quite well in this area also. A demonstration at the Danbury Fair focused attention on Petter and recently a 15 hp air cooled unit was set up on a well drill rig for Liftolt Well Drilling Company of Ridgefield, Conn. This is one of the new diesel applications that occur regularly.

EXTRAORDINARY economy can be shown with very small diesel plants which at times deserve the kind of attention given to big power plants. For example, a 7 hp water cooled Petter supplies the power and the heat for the new shop and the display and service building of Diesel Sales Company, Inc. on Route 6, Danbury, Conn. All the heat from the cooling water and the exhaust is captured with interesting results reported by A. J. Renna who heads this company. Electric power up to 5 kw is generated at an operating cost of under 1¢ per kw and the heat is a bonus. Looking at it the other way around, the diesel burns 4½ gal. of fuel in 24 hours to furnish light and heat but with the diesel shut down the oil burning heating plant consumes as much as 1½ gal. per hour. The system of heat recovery is a home-made one, too. During storm disruption of central power locally, this plant kept running.

THE UNION Building and Equipment Company, Passaic, N.J., operates over a wide area, as far south as Florida and is an extensive user of dieselized earthmoving equipment. They have ordered several Allis-Chalmers tractors powered by the Buda diesels now sold as Allis-Chalmers en-

gines. The vendors are Franz Tractor Company of New York City, local distributors for the A-C line with branches in various sections of the metropolitan area. These same distributors recently sold a pair of Cummins powered scrapers for use on the I.B.M. project at Kingston, N.Y. While these are referred to as Allis-Chalmers equipment, they are in fact La Plant Choate units taken over when Allis-Chalmers acquired that company.

IT IS REPORTED that the town of Hudson, Mass. is burning drainage from automobile crankcases in the municipal light plant diesels. The lube oil is processed with De Laval centrifugal purifiers in the same way as residual or Bunker C fuel. Economy is reported as good.

Joins Eaton



Lt. Gen. Bryant L. Boatner, USAF, Ret.

General Boatner, who graduated from West Point in 1928, has been a career airman. Upon graduation he immediately enrolled in the Army Flying School from which he was graduated in 1929. He will make his home in Cleveland.

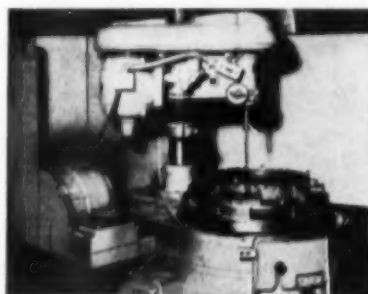
Lt. Gen. Bryant L. Boatner, U.S. Air Force, retired, has joined the staff of Eaton Manufacturing Company "to counsel and advise in the area of general aircraft affairs." H. J. McGinn, Eaton president, announced recently.

ROCKFORD

MEMO - Clutch must have accurate balance



ALL ROCKFORD clutch plates not only are carefully checked for accuracy of dimensions, but are inspected on an electronic balancing machine. Uniform operation, minimum wear,



Let our engineers show you how ROCKFORD quality safeguards insure low maintenance for ROCKFORD clutch equipped machines.

OVER



CENTER

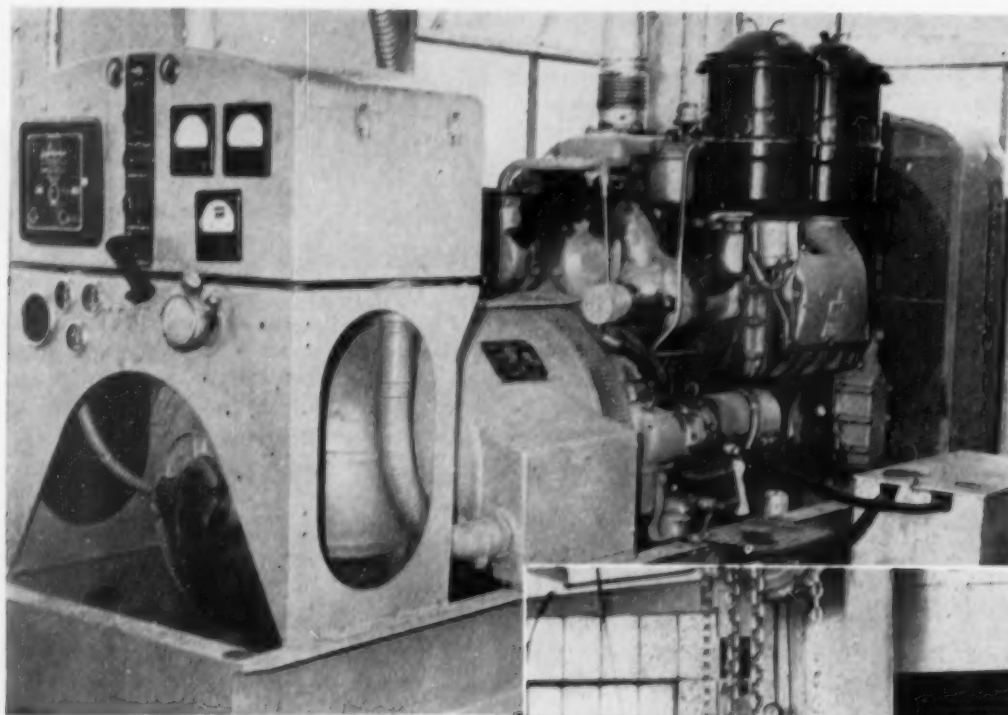
less frequent adjustment and long life qualities of ROCKFORD CLUTCHES thus are protected during production.

ROCKFORD
Clutch Division
BORG-WARNER

1321 Eighteenth Ave., Rockford, Ill.

CLUTCHES





operation of the plant is supplied by a 60 kw. General Motors diesel-electric set.

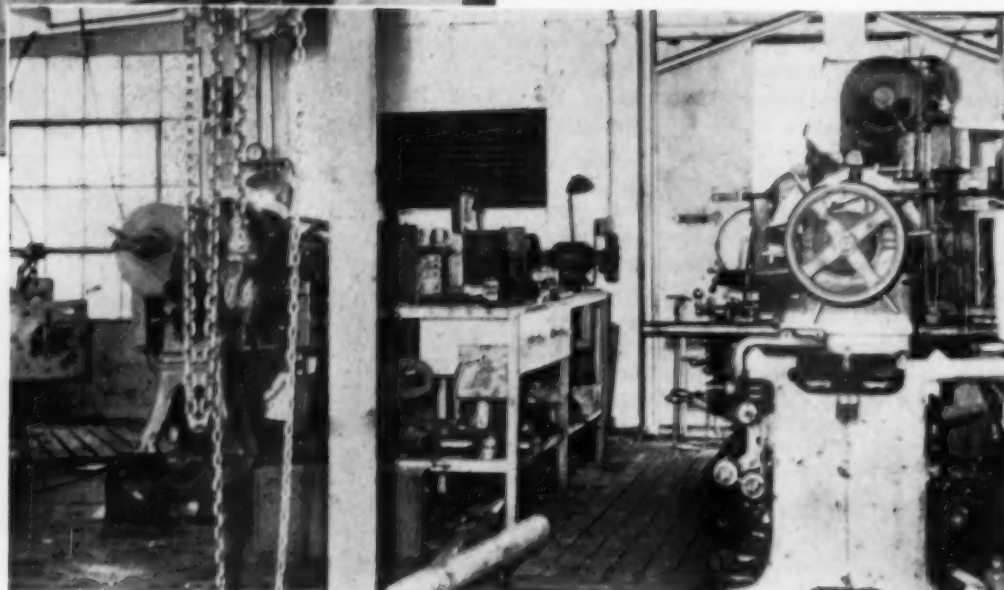
Mr. Manning, who formulated the idea of a portable servicing plant, explains that active areas of drilling "have moved so often in the rugged country of Wyoming and the rigs with them, that when emergencies arose it was sometimes difficult to give the prompt service required. It was only natural, therefore, to visualize a portable servicing plant of this type that could move from one location to another, offering immediate service to rigs operating in distant, isolated mountain areas."

A 60 kw. General Motors diesel-electric set supplies power for WOTCO's portable servicing plant. The unit is housed with a 1700-gallon fuel tank and is often called upon to operate 16 to 24 hours a day.

PORTABLE SERVICE PLANT

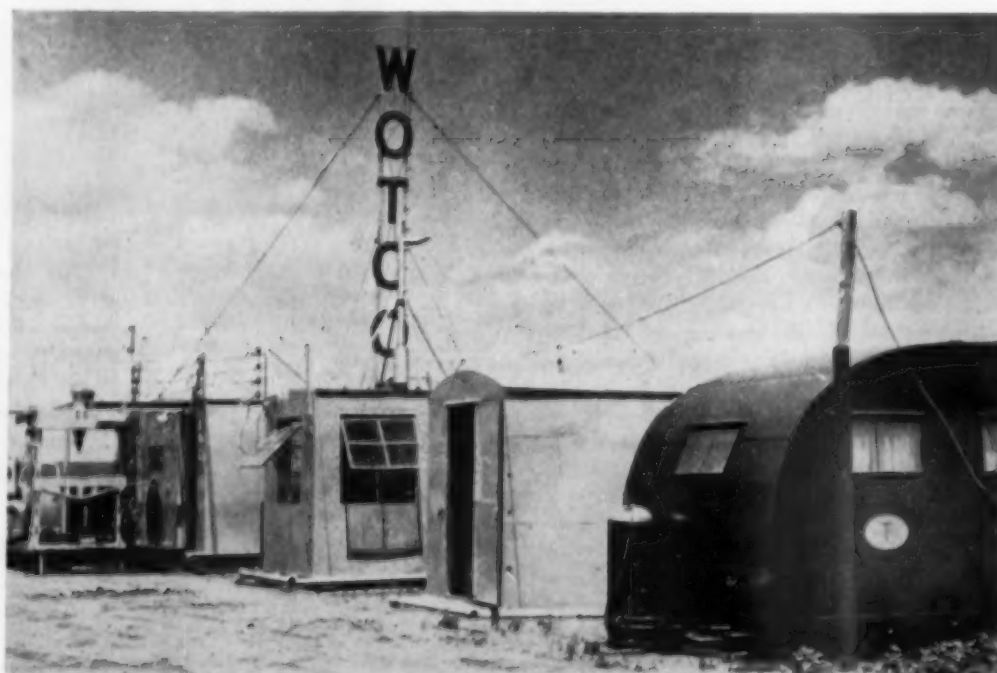
A NEW portable servicing plant designed for emergency repair work on relatively inaccessible oil rigs was recently put into operation near Clareton, Wyo., by the Western Oil Tool and Manufacturing Co., Inc., of Casper, dealer for General Motors Detroit Diesel Engine Division. Fred M. Manning, Jr., owner of WOTCO, reports that the idea of a portable servicing plant was fostered by the transient nature of the drilling business over considerable distances in Wyoming's mountainous regions and WOTCO's desire to render prompt, efficient service even under these difficult conditions.

Andrew R. Rasmussen, WOTCO's tool engineer who designed and supervised the construction of the portable plant, used many of the portability features found in today's oil field equipment. Fabrication was made at Casper and the initial set-up was made at Clareton. The plant was built in three sections to include a supply warehouse, a repair shop and a power building. Each section resembles an oil rig's "dog house," is mounted on a conventional oil-field type of skid base and can be carried by a single truck. The sections are independently wired and when in use rest on wood mats similar to those used for a drilling rig's substructure. A house trailer office travels with the three units. Power for the entire



Interior of portable repair shop at Clareton, Wyo., shows its variety of equipment. Shop is independently wired and can be moved by a single truck.

The plant, used for emergency repair work on dieselized drilling rigs operating in mountainous regions, consists of three buildings: repair shop, power plant and supply warehouse. House trailer at right travels with the units.



Combine Efforts

The Massey Machine Company, Inc., of Watertown, N.Y., has become a wholly owned subsidiary of Curtiss-Wright Corporation. Principal products of the Massey firm are hydraulic governors for diesel and gas engines, which will supplement the line of hydraulic governors manufactured by The Marquette Metal Products Company, of Cleveland, Ohio—another wholly owned subsidiary of Curtiss-Wright.

According to Albert G. Massey, president and general manager at Massey, and Fred E. Harrell, president and general manager at Marquette, both lines of governors will be continued. They state that the two companies are consolidating their research and engineering facilities, as well as the many governor patents held by both firms.

Although Massey Machine Company, Inc., will be operated as a division of The Marquette Metal Products Company, the firm will continue its operations in Watertown. The company's research and testing department there will be expanded. Mr. Harrell and Mr. Massey point out that the district representatives and service agencies of both companies are available to all customers, and that the combined firms can now furnish a complete line of hydraulic governors for every application. Moreover, the companies are engaged in a broad program of research in the field of centrifugal and other types of engine controls, to provide all industry with improved methods of speed regulation.

Issues 34th Edition

Truck operators will be interested in obtaining copies of the revised "Cost Record Book" just issued by The White Motor Company. The book provides a comprehensive yet simple system of analyzing truck operating costs and can be tailored to any truck-using business and any size fleet. The system has been adopted by many leading firms throughout the country, White reports. It is adaptable to either delivery service, highway operation or off-the road fleet. A sample copy may be obtained by writing The White Motor Company at its Cleveland, Ohio office. **ITS NEW**

Flexible Hose Bulletin

A 12-page, two-color, illustrated catalog (#152) on the complete line of Flexon flexible metal hose has just been released by Flexonics Corporation, Maywood, Illinois. The full range of flexible metal hose products are covered along with complete coupling data. An easy four-step metal hose selection guide is included. For your copy, write to Flex-

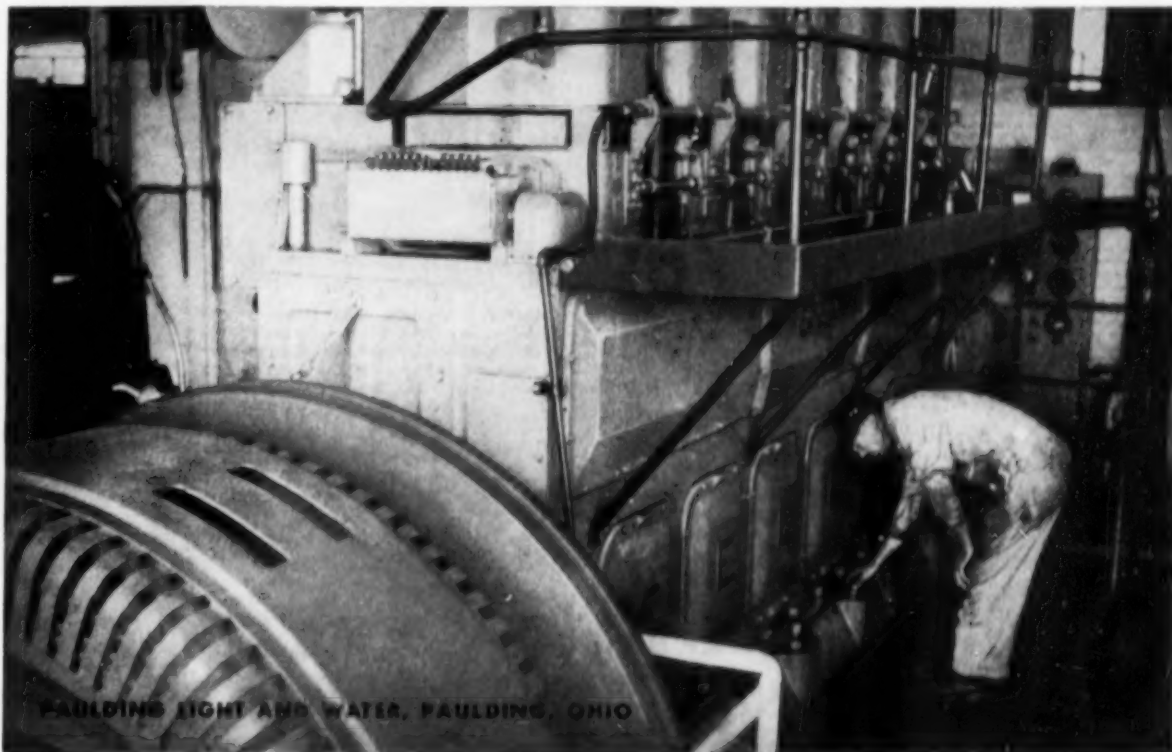
onics Corporation, 1325 South 3rd Avenue, Maywood, Illinois.

To Build Engineering Building

Trane president D. C. Minard has announced that bids would be taken by the company during early spring of 1956 for the construction of a 65,000 square foot, "L" shaped, engineering building.

The La Crosse company manufactures air conditioning, heating, ventilating and heat transfer equipment. "The engineering building," Mr. Minard said, "is urgently needed to provide space for Trane's product and design departments which have outgrown their present quarters due to the increased activity of the company in this growing area of its operation."

The main floor of the structure will include space for the company's product engineering department, design engineering department, several conference rooms, reception area, a microfilm room and blueprinting department. F. A. Fairbrother and George H. Miehl are architect and engineer for the job. Albert Kahn, Associated Architects & Engineers, Inc., Detroit, are consultants.



"16,587,402 H. P. hours without oil change using Cities Service C-300 Lube Oil!"

1000 KW Enterprise uses only one gallon of oil in 23,205 BHP hours, has no oil reclaimer.

The main part of the power output of Paulding Light and Water Company is developed by its dual-fuel, 1000 KW Enterprise Unit.

Mediocre performance can't be tolerated at Paulding . . . the power load is running twice that of seven years ago!

"Fortunately," says Superintendent James J. Leslie, "performance is tops—and much of the credit is due Cities Service C-300 Lube Oil. We really pile up hours with C-300 . . . and still get excellent engine life. I've never had the head off the Enterprise since it was first installed in 1953, yet compression, fire pressure, and fuel economy are still very good."

"We've actually logged up to 16,587,402 H.P. hours without an oil change. We use only 1.5 gallons of C-300 Lube Oil per day, which amounts to 23,205 brake-horsepower hours per gallon . . . and that's with no oil reclaimer! I'd recommend Cities Service to any power plant."

If you're interested in Mr. Leslie's recommendation, talk with your Cities Service Lubrication Engineer. He can tell you of other outstanding case histories. Or write: Cities Service Oil Co., Sixty Wall Tower, New York 5, N. Y.

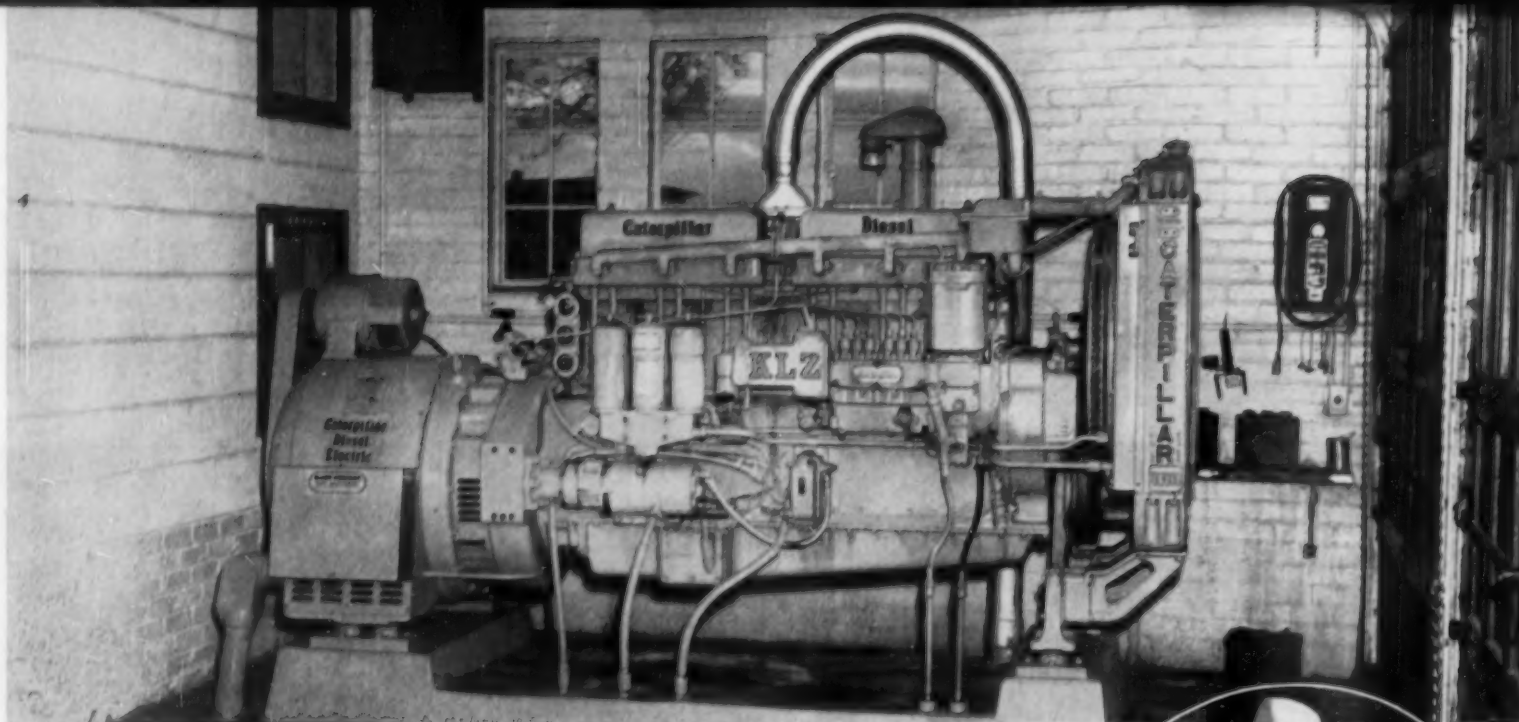


Electric Service Goes Hand in Hand with Cities Service at Paulding Light & Water. Paulding's Enterprise dual-fuel power unit gets 23,205 BHP hrs. for every gallon of Cities Service C-300 Oil that's consumed. Oil changes are made about every 11,000 hrs.



"We're Really Able to Pile Up Hours and still get good engine life using Cities Service C-300 Lube Oil," says Supt. Leslie. "I've never had the head off the Enterprise since it was installed in 1953. Compression, fire pressure, and fuel economy are excellent."

CITIES SERVICE
QUALITY PETROLEUM PRODUCTS



This Caterpillar D13000 diesel-electric set is used as standby, in case commercial power fails KLZ at Denver, Colo. By the fall of 1955, the engine had accumulated more than 500 hours of operation.

Harvey Wehrman, chief engineer at KLZ's radio and TV transmitter station. A manually-operated starting arrangement is a part of the Caterpillar diesel installation. The set provides 75 kw of electricity.



A CIVIL DEFENSE INSTALLATION

RADIO-TV STATION KLZ

DOES diesel standby power pay off in a radio station? "Yes," is the answer you would receive from Harvey Wehrman, chief engineer of KLZ, veteran Denver, Colo. radio station. KLZ is one of the pioneers in the use of diesel standby power at its transmitting facilities to insure the station's reputation for providing its listeners and advertising clients with uninterrupted service.

The station installed a 75-kw Caterpillar D13000 diesel electric set on August 25, 1947. Since that time the unit has proved invaluable in times when outside power has been cut off accidentally or when it was cut out purposely for repairs. The diesel unit has carried the station's transmitting load for as long as 24 hours at one stretch while maintenance work was being done by the local power company. In seven and a half years the engine has accumulated over 500 hours of service—the equivalent of many thousand dollars worth of air time.

The standby power maintains the reputation of its advertising salesmen. Say, a salesman sells a good account a choice program, but an electric storm interrupts the prime power source and the station is off the air all or a portion of that time.

He is in a difficult position to go back and try to resell the client, not to speak of the money the station loses by not being on the air. The two major mechanical problems KLZ overcame with the standby unit were (1) summer electric storms which occasionally cut off power and (2) power from a company suffering from growing pains in a rapidly expanding suburban community.

The high altitude and climate in the Denver area is conducive to the electric storms which are a thorn in the side of an organization such as KLZ which depends on uninterrupted power for its livelihood. On one occasion lightning struck the main line and caused a tremendous power line surge that blew out 13 fuses at the station and ruptured an underground lead covered feeder cable into the transmitter. It cost several thousand dollars for repair to lines, meters and transmitting equipment. But despite the interruption the station had power all the time from the standby engine. The policy at KLZ now is that if dark clouds appear in the sky and flutters appear on the line, the transmitter engineer switches over to the D13000 as a precaution against an outage or voltage dip. When the power company purposely cuts out power for repairs, the diesel standby engine not only provides protection to the station, but saves the company money. Since the engine is available to carry the transmitter load, the power company can get its repair job done at one-third of what it would otherwise cost, according to remarks by Mr. Wehrman.

The D13000 has a manually operated electrical starting arrangement, which Mr. Wehrman believes is the best system for KLZ's situation. The unit can be started and carrying a full load within 5 seconds. The cooling water in the engine is kept continually warm to insure quick starts. The transfer switch is located so that the engineer on duty can reach it from his seat at the control panel. The switch is illuminated constantly from

a light that is connected to the engine's batteries so that it will not go out during an outage. Though the engine's power is up in 5 seconds it is usually at least 30 seconds before the station is back on the air due to a relay sequence in the transmitter. This delay provides protection against damage to the tubes from the sudden changes in voltage caused by the stoppage and the starting that would ordinarily occur within a few seconds.

KLZ prefers the manual method to the automatic starting arrangement because, in the words of Mr. Wehrman, "We think we can calculate better than the automatic starting arrangement when we should switch over to auxiliary power. And there is little difference in the loss of time between the two starting systems." He points out that with the automatic start-stop, the engine would be turning on with almost every voltage dip which occurs all too frequently at KLZ—sometimes as often as eight to ten times a day. KLZ has worked out its own device whereby power will only transfer from the Caterpillar electric set to outside power, or vice versa, if there is adequate power available on the alternative source. The standby set is extremely important in the civil defense role KLZ would play in case of war. It is a foregone conclusion that one of the first targets enemy bombers would hit would be power stations. Yet it would take a direct hit on the transmitter before KLZ would be cut off from broadcasting vital information to the surrounding community. "There's no doubt that diesel standby power is a good investment," concluded Mr. Wehrman.

New President, Board Chairman

W. G. Frank, formerly executive vice president, has been named president of the American Air Filter Company, and W. M. Reed has been elevated from president to the newly created post of chairman of the board. Also elected at the recent meeting of the directors were Ben R. Shaver from secretary-treasurer to vice president and treasurer, and E. G. Mason from assistant secretary-treasurer to secretary. Mr. Frank came with American Air Filter when it was organized in 1929 through a consolidation of five air filter companies. He was formerly chief engineer with the National Air Filter Company, Chicago, one of the companies in the merger.

Mr. Reed was the founder of the Wm. Reed Engineering Company in 1922. Later its name was changed to Reed Air Filter Company and it was one of the firms involved in the consolidation. He has been president of AAF since its organization. Mr. Shaver joined American Air Filter in 1942 as secretary and treasurer. Prior to that he was assistant plant manager at Bernheim Distilling Company, Louisville. Mr. Mason was secretary-treasurer of the Herman Nelson Corporation, Moline, Illinois, which AAF absorbed in 1950. At this time he became assistant secretary-treasurer of American Air Filter Company.

New Literature

The Automatic Switch Company of Orange, New Jersey, designers and manufacturers of solenoid valves and electromagnetic controls, has prepared a technical bulletin on their midsize 3 way solenoid valve. New explosion-proof approvals and higher pressure ratings are now available for the Bulletin 8314 midsize valves. For complete details ask for Form V5010. **ITS NEW**

New Market

Since 1948, 165,000 air-cooled diesels were produced by Kloeckner-Humboldt-Deutz A.G. of Cologne, Germany, it was announced in a year-end statement recently issued by Hans G. Breustedt, vice president of Diesel Energy Corporation, 82 Beaver Street, New York City, sole U.S. representative of the German concern. Mr. Breustedt reports that air-cooled Deutz diesels have also become very popular in the United States and that great interest is shown, especially by truck owners and farmers.

"However, we notice that other United States industries are likewise attracted by our air-cooled Deutz diesels. In Germany, for instance, the air-cooled diesel motor is today used in the entire build-

ing machinery industry." Mr. Breustedt points out in his report that the Kloeckner-Humboldt-Deutz A.G. works were built in 1864 and is associated with the early work on internal combustion gas engines by Nicolas Otto, a statue of whom stands opposite the railway station of Deutz.

This company has now reached a com-

bined production of 165,000 diesel engines for the past five years and is today considered one of the world's largest diesel engine manufacturers. Kloeckner-Humboldt-Deutz A.G. is represented in the United States by Diesel Energy Corporation of 82 Beaver Street in New York City. A nation-wide sales and distributor net has been established in the United States during the past year.

IT'S HERE! JUST OFF THE PRESS! Bigger, better, completely revised, rewritten and brought up to date. It's Volume 20 of DIESEL ENGINE CATALOG, now ready for mailing. Mail orders are now being filled for this giant reference book with its all-new, profusely illustrated engine and accessory sections. Be sure of your copy of this limited edition, which costs \$10 postpaid plus California sales tax where applicable. Send checks or company form orders to DIESEL PROGRESS, Cole Station, Los Angeles 46, California.

Random Thoughts from a Filter Engineer

by Henry Matlock



- WHEN IT'S FUN TO BE WRONG
- WHY THREE SELF-CLEANING FILTERS INSTEAD OF ONE
- A DRY TYPE FILTER THAT TENDS TO CLEAN ITSELF

WHEN IT'S FUN TO BE WRONG

When a filter doesn't behave the way a manufacturer says it will, he has some explaining to do. Recently, we found ourselves in this position. Our liquid filters are performing more efficiently than we claim. And our customers have the facts and figures to prove it.

For instance, we claimed one filter would stop all particles larger than 46 microns but independent laboratory tests proved it stopped 99.2% of all particles larger than 20 microns! We claimed another filter would stop all particles larger than 81 microns. One customer made a series of tests and found 93% of the particles collected were smaller than 20 microns! Why the discrepancy? Didn't we know how good our own filters were?

We've known for a long time that our filters perform more efficiently than we guarantee. Here's why. If the openings in a filter will admit particles of 50 microns in size but no larger, that's the rating we give the filter. But, in actual practice, many particles of much smaller size are stopped. That's because liquid filters very quickly build up a "filter aids bed". Dirt particles wedge themselves in the 50 micron openings, actually reduce the size of the openings and prevent particles bigger than, say, 20 microns from passing through. This partially explains the exceptional results our customers report. And it's another reason why so many engine builders and contractors are adopting Air-Maze liquid filters as standard equipment.

WHY THREE SELF-CLEANING FILTERS INSTEAD OF ONE

The more suited a filter is to a problem, the better job it will do. That's why we at Air-Maze offer three different self-cleaning diesel air filters. The question is often asked, why three types? Well, in the diesel

engineering field air filters have to satisfy many different pressure drop requirements.

Where pressure loss is extremely critical, choose the Automaze, which incidentally can be furnished in multiple units to handle air flows up to 100,000 CFM or more. Our Automaze utilizes the pulse action cleaning provided by outside air pressure. For minimum pressure loss without any outside energy being required, the LPD (Lowest Pressure Drop) filter is the ticket. It's available in single units up to 20,000 CFM. And where pressure drop is not a critical factor, our standard type F oil bath filter can be used in single units up to 6500 CFM.

Of course you can see there may be some overlapping of these units, but they do illustrate the point that Air-Maze offers air filtration for diesel engines, compressors or blowers to meet almost every requirement. We even have a panel type air filter available in a self-enclosed housing. This one, type DH, requires manual servicing.

A DRY TYPE FILTER THAT TENDS TO CLEAN ITSELF



Dry Filter

If you need a particularly efficient dry type filter, our DA filter may be the best solution to your problem. Its felt media will stop dirt particles down to $\frac{3}{10}$ of a micron. And it's especially suited to applications where vibration is present. A good deal of the dirt that accumulates on this filter will be harmlessly shaken off. So, in a way, our DA filter is self-cleaning. Life

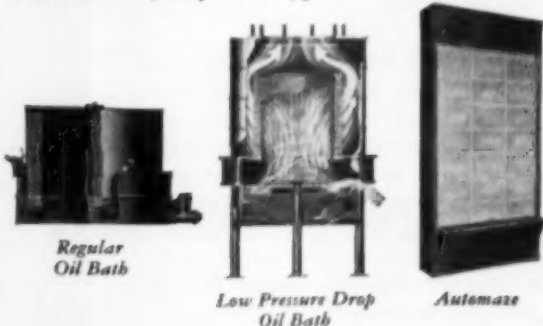
of the element can be considerably prolonged by removing dirt with suction or a solvent such as mineral spirits, or by blowing it off.

For high efficiency and low maintenance, our DA dry type filter is hard to beat. The Air-Maze Corporation, 25000 Miles Road, Cleveland 28, Ohio.



AIR-MAZE
The Filter Engineers

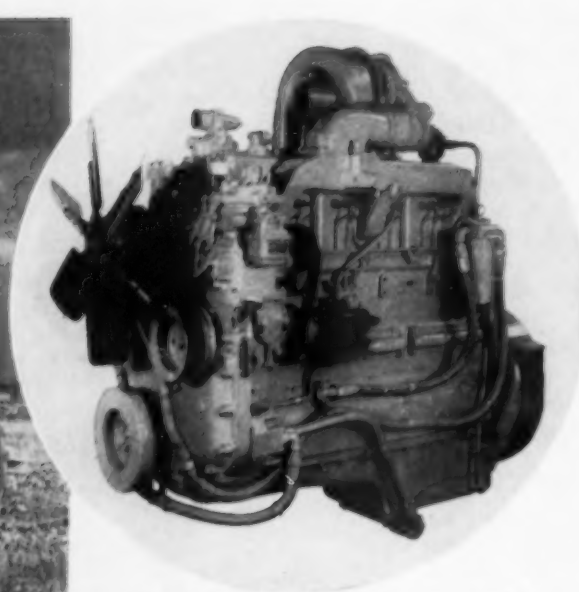
AIR FILTERS • SILENCERS • SPARK ARRESTERS
LIQUID FILTERS • OIL SEPARATORS • GREASE FILTERS



Regular Oil Bath

Low Pressure Drop Oil Bath

Automaze



➤ The turbocharger on the new model Cummins diesels can be mounted either on top as shown above, or on the side. Pictured is the Model NT-6.

➤ This International Harvester Pay Scraper, Model 2T75 is powered by a 262-hp Model NTO-6-B1 Cummins Turbodiesel. Capacity of the high-speed earth mover is 18 cu. yards. Power curves for the new Turbodiesels are shown below.

CUMMINS NTO-6 AND NT-6 TURBODIESELS

PRODUCTION of two new turbocharged diesel engines, the NTO-6 and NT-6 Turbodiesels, is announced by Cummins Engine Company, Inc. Now available for automotive, off-highway, industrial and marine applications, the NTO-6 develops 262 hp while the NT-6 is rated at 250 hp. Maximum speed of both is 2100 rpm. Essentially of the same design as the 200 hp NH-600, both the NTO-6 and the NT-6 Turbodiesels receive their increased power with the addition of a turbocharger.

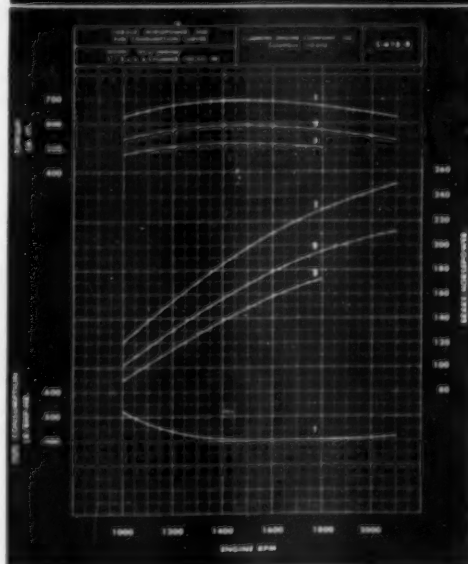
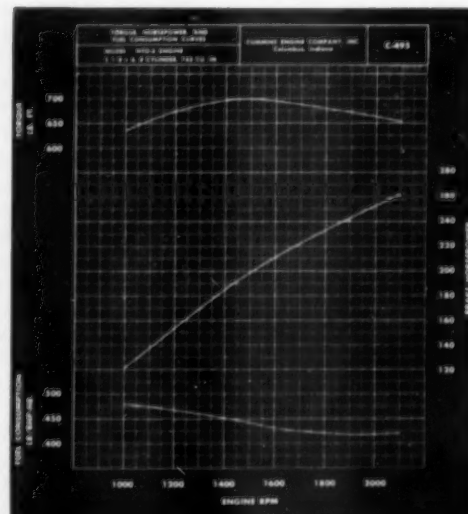
Both the NTO-6 and NT-6 are six-cylinder, 4-cycle engines with a bore and stroke of $5\frac{1}{8} \times 6$ in. and a piston displacement of 743 cu. ins. Compression ratio for both engines is 15.5-to-1, while the weight for both is 2546 pounds. Turbocharging, which harnesses exhaust gases normally wasted, produces this extra 50 horsepower by achieving a more perfect air-fuel mixture in the combustion chamber.

The turbocharger is a simple gas turbine located in the exhaust system. It is connected through a common shaft to a centrifugal blower. Expansion of the exhaust gases in the turbine chamber puts exhaust heat to work by rotating the turbine blades, shaft, and blower at high speed. By creating pressure in the engine intake manifold, the blower packs a greater weight of air into the cylinder. This additional air allows a greater fuel charge to be burned completely, thus creating additional horsepower. Cummins engineers also point out that fuel consumption per developed horsepower is maintained at a low level in both new engines because the heat used to drive the blower is not wasted. The turbocharger does not absorb de-

veloped power as in the case of engines equipped with gear or belt driven blowers. More horsepower per pound weight of engine and greater efficiency are two of the advantages. Turbochargers are available mounted either on the side or top.

Some of the other features of these two Turbodiesels are: Fully counterbalanced crankshaft which is drop-forged from high strength alloy steel. Bearing journals are induction hardened. The crankshaft is protected from torsional vibrations by a viscous-type vibration damper mounted on the front end of the crankshaft. Main bearings are steel-backed precision type, copper lead inserts with a total area of 192 sq. ins. Standard equipment on the engines is the Cummins PT Fuel System. This fuel system permits operation on all commercial diesel fuel weights, although No. 2 diesel or furnace oil is recommended for lowest operating costs. The PT Fuel System positive governor control for both idling and maximum speed assures equal fuel delivery to all cylinders; has exceptional efficiency at all loads and speeds; and assures equal loading of component parts, according to Cummins officials.

The water pump on both engines is the circulating, centrifugal type, driven by two V-belts. The electrical equipment includes a 12/24 volt system with a 24-volt starting motor; 50-ampere generator; series parallel switch; voltage regulator; and push button starting switch. These new Cummins diesels have been designed to answer the demand for a lightweight, high-speed diesel engine in the 250-262 hp class, for automotive, construction and various industrial applications.



Pressure Indicator

A new pressure indicator recently introduced in this country from Switzerland features a quartz crystal transducer and a patented "composite" diaphragm. Accuracy and excellent repeatability are inherent properties of quartz transducers it is claimed, because crystalline quartz is little effected by temperature and is practically immune to aging effects. In addition the high strength and mechanical stability make quartz the ideal transducer for wide pressure ranges and high resonant frequencies.

The SLM Pressure Indicator offers many advantages, according to the maker, over the more conventional strain gage, capacitance and inductive type pressure pickups and other crystal type pressure transducers. For most engine applications, including cylinder pressure measurements on supercharged, or air-cooled diesel engines, no special cooling of the pickup is needed.

The same SLM gage is normally used to measure all pressures from less than 0.1 psi to greater than 3000 psi. With the high pressure adapter this range can be extended to above 20,000 psi. The same gage also measures vacuum.

The instrument is manufactured by Kistler Instrument Co., 15 Webster St., No. Tonawanda, N.Y.

(ITS NEW)

Water Demineralizer

Natural water is subject to contamination by minerals. While safe for drinking purposes, it is not practicable for use in batteries. For this reason distilled water is used in the latter application. Demineralization, however, can be accomplished by the use of the Hydrion battery water unit.

According to the maker, A. E. Tomkin & Company, the Hydrion removes mineral impurities from ordinary tap water through ion exchange. The water, passing through the Hydrion unit, merely loses its metallic impurities. Nothing is added to the water. Each refill charge has a definite capacity depending on the mineral content of the water. No heat, cooling or special skills are required to operate the Hydrion. Water can be drawn off continuously or only when required.

The Hydrion is manufactured by A. E. Tomkin & Co., 1507 M St., N.W., Washington 5, D.C. For literature on their product, write the company.

(ITS NEW)

Secretary Treasurer

Mr. M. H. O'Brien, president of Anderson-O'Brien Company, General Motors

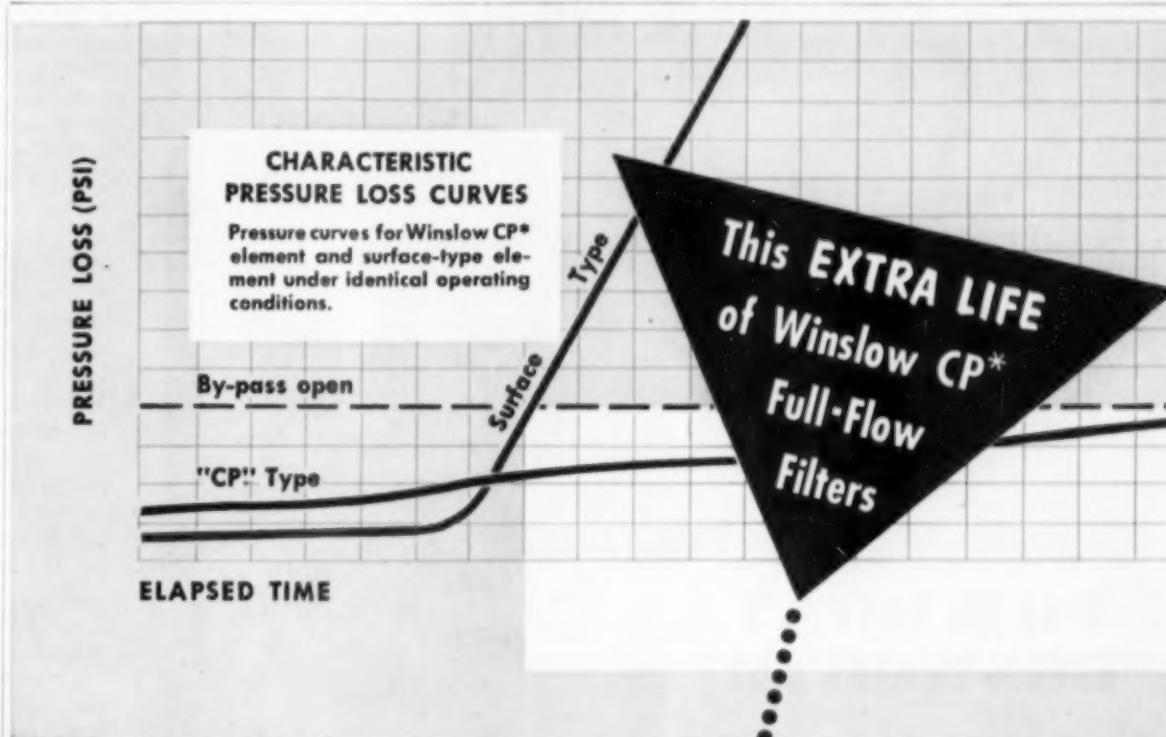
diesel distributors for Southern California, has announced that James D. Ryan has become associated with the company as secretary-treasurer. Mr. Ryan attended Wabash College and was associated with the Bank of America National Trust & Savings Association for 26 years, the last six of which he was manager of the Broadway-Washington Branch.

New Waste Heat Evaporators

Potable water from sea water at the cost of 53 cents for 1,000 gallons is now possible with the new Cleaver-Brooks waste heat evaporator, according to a recent report by the company. Utilizing the waste heat from ship's diesel engines, the new evaporator in effect raises diesel efficiency from 30% to 60% in producing

an abundant source of pure water for shipboard uses.

It is expected that the units will find application on offshore drilling rigs where fresh water is essential for drilling mud make-up, drinking and bathing. The unit is used in oilfields where diesel engine power can be more effectively harnessed.



Saves both the Oil and the Engine

Laboratory tests and operating experience indicate that Winslow CP* filters have as much as 50% more useful life than a surface-type filter. As a result, both the lube oil and the engine are protected beyond normal filter service.

Contractors, for instance, report that useful oil life in diesel-powered equipment has been extended from 80 hours to 300 hours, with Winslow CP* filters.

Most important, engines are protected all the time with Winslow full-flow filtration... protected during cold starts, while idling and against excessive dirt... protected if a bearing fails. Because of this better oil filtration, engines last longer and require less maintenance. A modest investment in Winslow filters returns substantial dividends.



THE CP* PRINCIPLE

Winslow patented CP* (Controlled Pressure) elements are designed to continuously self-adjust the pressure within the filter and allow for a full stream of filtered oil from the filter without opening by-pass valves. This is accomplished through the dual flow capacity, with two types of material, as illustrated.

WINSLOW FILTERS

*CP is fully protected by patents and trademarks

W-56-1

Winslow Engineering Company

4069 Hellis Street • Oakland 8, California



TOWBOAT "BOSWORTH"

By W. L. BODE

WITH more than a year of successful operations behind her, the *R. H. Bosworth* has proved that the characteristics designed by Dravo Corp. into its Ram-class towboats fulfilled anticipations of the builders. These vessels were conceived to perform specialized functions such as shuttling barges between terminals, making short-range tows, and handling non-self-propelled barges on construction jobs. Those specifications fit the requirements of Capt. Bob Bosworth's Point Towing Co. to the well-known "T."

Although still several years shy of age 30, Captain Bosworth organized his own company in 1952 and set up his headquarters opposite Point Pleasant, W. Va., at the juncture of the Ohio and Kanawha rivers. He offers a specialized service from his own O-Kan Harbor.

Fourth of the Dravo Ram-class boats, the *Bosworth* was put into service in the fall of 1954. She is a 580-hp vessel, power being provided by a pair of 290-hp Atlas diesels. They are supercharged engines and turn at 1200 rpm, driving through Twin Disc reverse reduction gears of 2.93:1 ratio. Propellers are installed in Kort Nozzles. Boats of this class are 70 ft. in length, have a beam of 20 ft., and an 8-ft. draft amidships with bunkers loaded.

Point Towing Co. engages in contract towing and also derives a heavy volume of its business from a "shuttle trade." One or more barges are taken



Capt. R. H. Bosworth, owner of the Point Towing Co., whose equipment includes the Dravo-built, Ram-class *Bosworth*, shown above.

The *Bosworth* is powered by two Atlas Imperial diesels, each developing 290 hp at 1200 rpm. Charles Taylor is shown wiping down one of the main propulsion engines.



from the big, long-haul tows and are delivered to their destination—an operation that would be uneconomical for larger towboats. To operate such a service at a profit, according to "Captain Bob," requisites are versatile pushing power, speed, and good maneuverability. The design of the vessel and his propulsion engines give him all of these to the point where he is enthusiastic.

"Some of the jobs we have handled are almost unbelievable for a boat the size of the *Bosworth*," he said. "On one trip she pushed 22 empty deck barges 42 miles up the Ohio to a sand-digger location. We figured her speed to be $5\frac{1}{4}$ miles per hour. And when you consider that she was handling an area of 57,200 sq. ft., why that's really shoving. Another time, last December, with the Ohio running heavy and about half the wickets down at most of the dams, we headed upstream with one 240x50-ft. barge with 2200 tons of sulphur and one 195x35-ft. tank barge containing 1200 tons of gasoline. Later, two more barges, each carrying 1200 tons of crude oil, were added to the tow. Shoving the four barges with 5800 tons of cargo against a tough current and through such swift narrows as Brown's Island near Weirton, the *Bosworth* averaged 4.3 miles per hour on the 136-mile trip to Freedom, Pa. This takes into account delay at the locks and locking time. Other towboats of the *Bosworth*'s size would have had a lot of double-tripping on their hands to have completed that run.

"What I like about this boat," the owner continued, "is the absence of gingerbread. And yet it has everything we need for our operations. It is easy to maintain. With the DeLaval hydraulic pump for the rudder system operating off the main engines, we don't have to worry about keeping an extra motor running. There is an electric one for standby, however. The same thing is true of the generator. It takes its power off the main engine stub shaft so we don't have to keep an extra diesel running. Of course, we are equipped with a standby GMC diesel-generator set to take care of overloads, and to use when the main engines are down. My only complaint is that the *Bosworth* is so comfortable and easy to handle that I have to use pressure to get crews for the other boats. All my men want duty on the *Bosworth*."

West Coast Diesel News

By James Joseph

GEORGE W. KNEASS CO. is completing a 36-ft. fishing boat installed with a Model 3-71 GM Marine diesel, with 3:1 reduction.

TO CRESWELL, ORE.'s James Brothers, a Kenworth 829 powered by a Buda 6DAS-779, sales through Hamilton Engine Sales, Inc.

FOR THE California Water & Telephone Co., Monrovia, Calif., a 180 hp, 6 cyl Fairbanks-Morse 49B4 $\frac{1}{2}$, 100 kw diesel engine.

FAIRBANKS, Alaska's Hall Electric Co. has taken delivery of a Fairbanks-Morse 45B4 $\frac{1}{2}$, 6 kw, 10 $\frac{1}{2}$ hp diesel generating set.

UNION DIESEL announces shipment of three supercharged 800 kw engines to the Strategic Air Command Center, Offutt AFB, Nebraska.

TO NAPDON, Inc., a Buda marine diesel engine, Model 4BDMR-182. Sale was via Anderson-BeVier Co., Inc., of Los Angeles.

OPERATING the Redding (Calif.) area are two new Kenworths powered with Model 6DAT-844 Budas, the owner Merle Hinkle, Redding.

JACUZZI PUMP Co. is applying two 2-71 GM industrial diesels to pumping units destined for Morrison-Knudsen Co. in Korea.

RICHFIELD OIL Corp. has purchased (through Crofton Diesel Engine Co., Inc., San Pedro) a GM 3061-A auxiliary aboard an LCU working offshore oil fields.

FOR POWERING the 38 ft. Kettenburg fisher *Bill*, a GM 3071-A with 3:1 reduction and direct drive front power take-off, for operation off San Diego.

TWO GM 6-71's in a symmetrically matched pair with 3.75:1 reduction, direct drive front power take-offs for main propulsion are powering Philip R. Park Co.'s kelp barge, off San Pedro, Calif.

A GM 62203 as main propulsion powers the purse seiner *California Rose*, owned by San Pedro's A. K. Anderson. Seiner's diesel engine has 4.5:1 reduction with 3:1 opposite engine rotation front power take-off.

TO TILLAMOOK Naval Air Station, an FTP-4024 Allis-Chalmers materials

handling truck, for moving veneer and plywood, in the Tillamook area.

LOG-HAULING in the Eugene (Ore.) area is Kenneth Bruhn's Buda 6DAS-844 (280 hp) repowered IH truck.

UNDER construction at Union Diesel's Oakland (Calif.) works, a number of supercharged engines for a new power

plant in the Philippines. Engines develop 750 hp at 514 rpm, and drive GE generators.

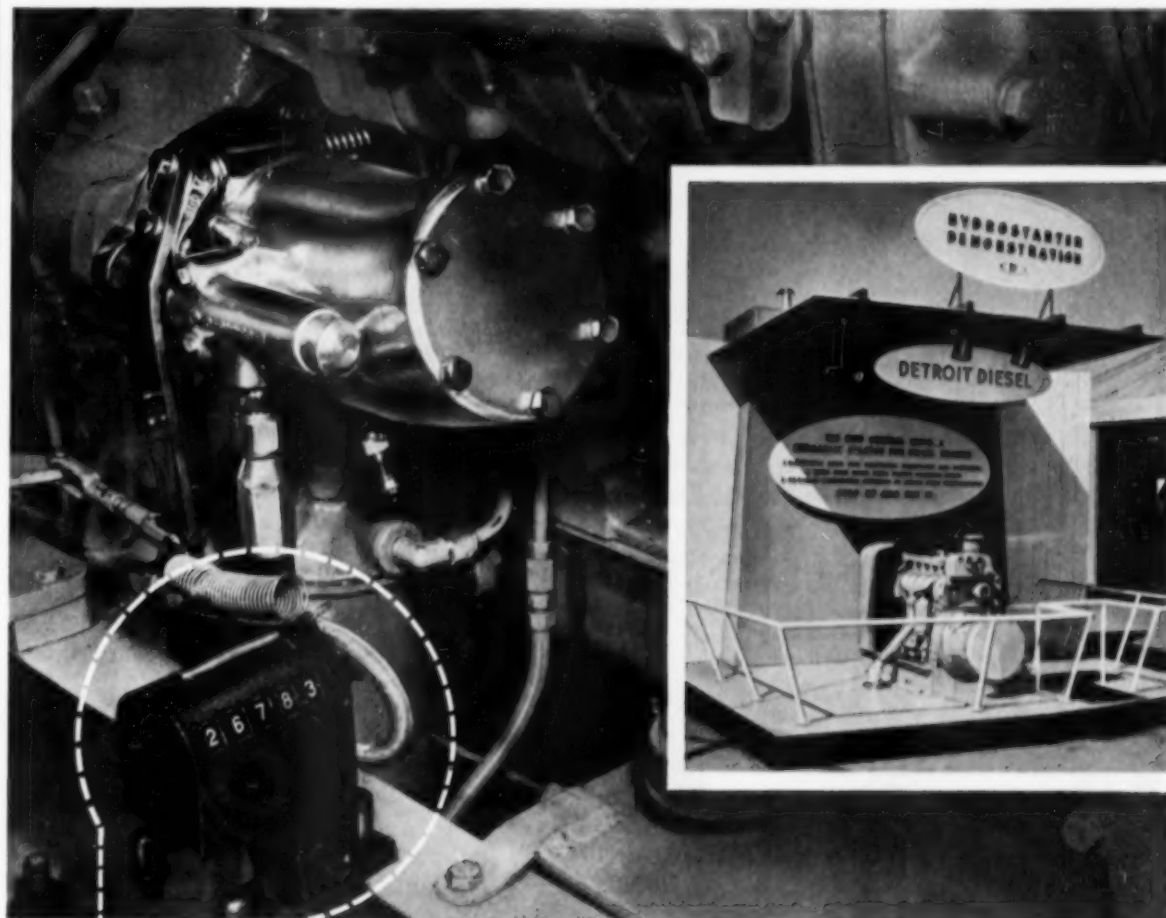
TO OREGON State Highway Dept., Salem, a Fairbanks-Morse 48AG4 $\frac{1}{2}$, 28 hp, 15 kw diesel generating set.

SAN LEANDRO, Calif.'s Western Electric Co. division has taken delivery of

a Fairbanks-Morse 3 kw 45B3 $\frac{1}{2}$ diesel generating set.

ANOTHER 45B3 $\frac{1}{2}$, 5 $\frac{1}{4}$ hp generating set (Fairbanks-Morse) has gone to Honolulu's P. S. Pell & Co.

TO BARNEY HELSER, Beaverton, Ore., a Buda 6DA-844 for powering a gravel crusher.



26,783 Starts in 26 days at GM Powerama!



HERE'S PROOF of the rugged dependability of a General Motors Hydrostarter—the new, low-cost hydraulic starting system now available on all GM Detroit Diesel engines:

On public demonstration at the GM Powerama, a Hydrostarter started a GM Detroit Diesel 26,783 times in 26 days—an average of more than 1,000 starts per 12-hour day—more than 1 start every minute.

A Hydrostarter gets a GM Detroit Diesel up to starting speeds 80% faster than regular starting systems—costs less to maintain than electric starters—sells for a far lower price than any other non-electric Diesel starter.

And it gives you fast, sure starts—even at sub-zero temperatures, or when your equipment has been standing idle for long periods of time.

Call your GM Diesel Distributor for full details on the GM Hydrostarter—or write direct for more information.

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Engine Division of General Motors

Single Engines... 30 to 300 H.P.
Multiple Units... Up to 893 H.P.

America's Largest Builder of Diesel Engines



Florida Diesel News

By Ed Dennis

ELLIS DIESEL Sales & Service in Ft. Lauderdale repowered a 42 foot harbor tug for Industrial Construction Co. with a General Motors model 6-110 diesel rated 300 hp with GM hydraulic r&r gears and control.

THE HOMESTEAD Air Force Base control tower received a model 6-DAG-779 Buda diesel engine rated 128 hp at 1200 rpm. This 6 cyl. diesel drives a 60 kw Allis-Chalmers generator, sold by Peninsular Armature Works Inc. of Miami.

CUMMINS DIESELS were selected for repowering the *Sea Dot III* from gaso-

line engines. Two model N. R. T. 601 Cummins with Capital r&r gears were used in the installation.

A SUPERIOR diesel model DCB 8 drives the Westinghouse 100 kw generator on the new dredge built at Auto Marine Engines, Miami. the main engine is a General Motors 8-268 which pulls the Maddox sand pump.

AT TAMPA, the General Engine & Equipment Co. installed a General Motors model 4-71 diesel for the Evans Properties Inc. of Dade City. It is used on a deep well for irrigation.

FLORIDA GEORGIA Tractor Co. of Miami delivered a T.D. 18 International Tractor to Tom Cothron of Key Largo and a model 95 Northwest dragline with a Murphy diesel to Cate Contractors of Ft. Lauderdale.

ANOTHER PARTY fishing boat has been added to the *Pop-eye* fleet. #3 was built by Chris Boat Works in Miami and powered with 3 General Motors diesels the same as her two sister ships.

A HERCULES diesel model D.W.O.C. rated 38 hp at 1600 rpm with Borg-Warner 2:1 r&r gears for the 21x8 dredge tender built at Auto Marine of Miami, Florida.

A FAIRBANKS-MORSE installation included a model 49B4 1/4 6 cyl. rated 180 hp and a model 45B3 1/4 rated 5 1/4 hp at Potts-Brown Co. of Charlotte, N. C. for the filter plant at Fort Bragg.

ON THE *Inagua Ranger* for Port au Prince, Haiti 2 #70 Caterpillar diesel scrapers and a D315 diesel generating set; for future shipment a D8 and D4 tractor plus 5 D7 tractors. This vessel is the sister ship of the *Inagua Shipper* called the United Nations Ship in DIESEL PROGRESS May 1953.

AT FT. LAUDERDALE Water Works, two GM Hydrostarters were installed on the two GM 6-110 diesel engines. Using 2 hydrostarters but only one oil reservoir, accumulator and manual pump this installation was engineered by George Reynolds of Ellis Diesel Sales & Service, Fort Lauderdale. This is believed to be the first of its kind in the South.

THE MANITOWOC crane owned by Hercules Concrete Pile Co. of West Palm Beach, received an HBIS 200 hp Cummins diesel while at Miami. Hooper Equipment Co. received an NHRIS Cummins 300 hp in a Bucyrus-Erie crane.

THE FT. LAUDERDALE Motor Boat Show Inc. will be held at the War Memorial Auditorium, No. Federal Highway, February 2nd through 5th, 1956. Proceeds to go to the Downtown Kiwanis Crippled Children's Fund.

JOHN E. MATTON & SON, INC., PICKS

GM TURBOCHARGED DIESEL POWER

General Motors Turbocharged Diesel power will make the new tug "MATTON" the most powerful tug in the Matton fleet. The "MATTON" will operate on the New York State Barge Canal, the Hudson River, the Great Lakes and the Atlantic Seaboard.

Turbocharging the GM Diesel increases its power 75% with comparatively little increase in engine size and a 30% reduction in weight per horsepower. And horsepower for horsepower, a GM Turbocharged Diesel costs less to install, run and maintain. If you need power for towboats, tankers, dredges, tugs, cargo ships . . . or any other application—specifying a GM Turbocharged Diesel can result in tremendous savings. Get the facts from your local Cleveland Diesel Engine Division Representative or write direct.



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Miami, Fla., 2515 N. W. 14th Street, Tel.: 64-2652
New Orleans, La., 737 Baronne St., Tel.: Magnolia 6761
New York, N. Y., 10 East 40th Street, Tel.: Murray Hill 3-4373
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IT'S HERE! JUST OFF THE PRESS! Bigger, better, completely revised, rewritten and brought up to date. It's Volume 20 of DIESEL ENGINE CATALOG, now ready for mailing. Mail orders are now being filled for this giant reference book with its all-new, profusely illustrated engine and accessory sections. Be sure of your copy of this limited edition, which costs \$10 postpaid plus California sales tax where applicable. Send checks or company form orders to DIESEL PROGRESS, Cole Station, Los Angeles 46, California.

Elected President of SAE

George A. Delaney, chief engineer of GM's Pontiac Motor Division recently took office as 1956 president of the Society of Automotive Engineers. He succeeds C. G. A. Rosen, 1955 SAE President, who relinquished the position at a brief ceremony during the Society's annual business meeting at the Sheraton-Cadillac, Detroit. Mr. Delaney has long been active in the SAE and has contributed to the Society's growth as a member and chairman of the Society's Technical Board and other important posts.

He was born in Centerville, Mo. and in 1917 he graduated from the University of Missouri. After serving several years as a first lieutenant in the Army he joined the old Paige-Detroit Motor Car Co. in Detroit as a trouble-shooter. Before that company became Graham-Paige he had been made assistant chief engineer. He joined Pontiac as electrical engineer in 1934, became assistant chief engineer in 1939, and chief engineer in 1946. During World War II he supervised aircraft engineering at GM's Fisher Body Division.

New Line of Batteries

Exide Industrial Division of The Electric Storage Battery Company has just introduced a new line of flat-plate motive power batteries to complement its long-life tubular plate Exide-Ironclad industrial battery line. Using the trade name Exide-Powerclad, they are described as premium flat-plate batteries with triple insulation. They are available at lower first cost.

The new batteries are for use in electric industrial fork and lift trucks, mine locomotive power and marine applications. Further information on the new line may be obtained by writing to Dept. PC, Exide Industrial Division, The Electric Storage Battery Company, Box 8109, Philadelphia 1, Pa.

District Manager

Robert J. Koch, field sales manager of the Morse Chain Company, Ithaca, New York, announces the appointment of Raymond H. Whitney as Southeastern district manager for the company's complete line of power transmission products and equipment.

Mr. Whitney has been engaged in the sale of power transmission products for the past 14 years, and has had extensive experience in southern tobacco, textile and paper operations, as well as in the general industrial field. Mr. Whitney will headquarter in Charlotte, North Carolina.

Sees Factory Repair for Diesel Locomotives

Like today's automobile, which seldom undergoes repairs at home, the diesel electric locomotive someday will be serviced by the manufacturers, a General Electric Company engineer reported recently at the Winter General Meeting of the American Institute of Electrical En-

gineers in the Hotel Statler, New York. This prediction was made by K. O. Anderson, of Erie, Pa., in a paper, "Modernization During Factory Rebuilding of Diesel-Electric and Electric Locomotives." The paper included a description of the rebuilding of 20 electric locomotives for the New York Central Railroad for use between Grand Central Station, New York, and Harmon, N.Y.

One of the rebuilt locomotives is scheduled to be on exhibition at Grand Central Station during the AIEE Meeting.

One of the reasons for factory rebuilding and heavy repair, in contrast to the old practice of undertaking this work in railroad shops, is the complexity of the diesel electric locomotive in comparison with the steam engine, he said.

THERE'S ONE RIGHT ANSWER IN ENGINEERING...

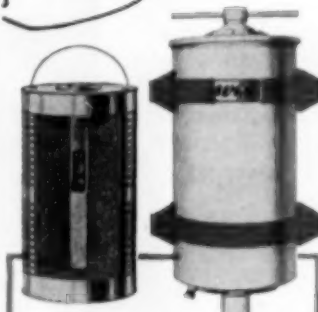


...AND IN DIESEL OIL FILTRATION

Whatever your Diesel filtration problem, WIX Engineering, Research and Development provide the right answer with slide-rule precision. The complete WIX Line includes Oil Filters and HEVI-DUTY Cartridges for every filter-equipped Diesel engine...on construction equipment, trucks and buses, marine, railroad and stationary engines—for fuel or lubricating oil.

Tested WIX Filtrants keep oil cleaner for longer periods. WIX Engineered Cartridge construction assures precise fit and ease of installation. Extensive laboratory facilities, constant field testing and accumulated know-how of many years' experience are your guarantee of the utmost in efficient, economical filtration.

Let WIX Engineering solve your Diesel filtration problems! Write today for the complete WIX Catalog of Filter Cartridges for Fuel or Lubricating Oils...or for the assistance of WIX Filtration Engineers.



Large-Capacity Filters, including the WF-750 with bar-type cover handle for heavy duty applications—eliminates troublesome cover bolts, speeds cartridge changing.

Can and Sock-type Cartridges for fuel and lube oil filtration—Filtrant is density-packed in rust-proof metal can or one-piece, lint-free cotton sock.

Prescription-type, HEVI-DUTY Filtrants: Flock-type SPECIAL BLEND for Diesel fuel and lube oil, Resilient Density WIXITE for by-pass systems, choice of Premium WIX-KNIT or Pleated POROSITE for full-flow systems.

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At the Hacienda's refinery, sugar cane is unloaded from trucks by a diesel-driven P&H crane. There are four Lorain and two P&H dieselized cranes in the operation.

One of the four Cat-powered Lorain cranes is shown in the fields, loading trucks for their trip to the mill.



PERUVIAN HACIENDA IS DIESELIZED

HACIENDA Cayalti, owned by Aspillaga Anderson Hnos., is a modern Peruvian sugar plantation in South America where sugar cane is handled, largely by dieselized equipment, from the time of planting right up to the point where it is loaded on a ship as a refined product—a complete self-contained operation. Sugar cane is the only strictly commercial crop grown on the Hacienda Cayalti's 8700 acres. It produces about 27,275 metric tons of cane a year which is turned into approximately 5,500,000 pounds of sugar at the plantation's own refinery.

There are 7413 acres of surrounding land, owned by several cane farmers, which produces nearly 22,725 tons of cane. This is also processed at the Hacienda Cayalti sugar mill and refinery. The additional 4,630,000 pounds produced from this cane gives the refinery a total yearly output of approximately 10,000,000 pounds of sugar. After the sugar is refined, it is transported from the Hacienda Cayalti to Port Eten, over a narrow gauge railway operated by Aspillaga Anderson Hnos. From there it is shipped out on cargo ships—two-thirds going to export markets and the other third being sold in Peru. To make the operation even more complete the company is one of the few sugar plantations to have its own paper mill using bagasse left after the cane has been processed.

To operate this vast plantation, Aspillaga Anderson Hnos. has 4000 employees who live on the plantation with their families. The total population of Hacienda Cayalti is 12,000 persons, for whom the owners make available housing, a hospital, 11 schools, churches, movie theatre, stores, etc. Besides the sugar crop sold commercially, the Hacienda Cayalti also grows certain food crops which are made available to the workers who live there.

Aspillaga Anderson Hnos. also has a modern mechanized operation. The company's machinery inven-

tory includes seven Caterpillar D7 tractors, six Cat D4 tractors, six Oliver wheel tractors, 10 International wheel tractors, three Massey-Harris wheel tractors, four Lorain and two P & H draglines. In addition, the Hacienda Cayalti has a Plymouth locomotive, powered by a 170-hp Cat D326 diesel engine, to haul cane from the fields to the mill and sugar from the refinery to the port. Aspillaga Anderson Hnos. has 70 kilometers of narrow gauge track in use on the plantation.

Hacienda Cayalti, a rice plantation when it was first put under cultivation 100 years ago, has a plentiful supply of water for irrigation—the life blood of the Peruvian coastal farmers. Because of the mild climate and the fact that cane is constantly irrigated, Hacienda Cayalti is able to rotate its crops and harvest throughout the year. Consequently, the sugar refinery operates about 11 months a year. It is shut down one month annually for repairs, vacations and general cleanup.

After the fields have been burned off to eliminate dry leaves and foliage from the cane stalks and workmen have cut the cane and thrown it in neat windrows across the cane rows, specially designed push rakes, mounted on Cat D4 tractors, bunch cane to ready it for loading on trucks or railroad cars. This push rake consists of two prongs extended from a curved blade with high ribbed extensions on top. The prongs are spaced so they fit into the furrows. With the cane windrowed crosswise to the furrows, the push rake operator can easily get the prongs under the cane and bunch it in uniform piles. All six of the plantation's D4 track-type tractors have these attachments. A single D4 is capable of bunching 300 tons of cane a day.

After it has been bunched by the track-type tractors, one of the six cranes, with a sling attachment, loads the cane into the trucks for transportation to the mill. Mules are called in to assist the crane.

With the cane bunched over the furrows, two long rods are started along the furrows under the cane pile and pulled through by the mules. These rods carry the sling cables under the pile so they can be attached to the crane and loaded on the trucks.

After the final ratoon crop is completed on the old root growth, the cane field is surface reformed before a new planting is started. Cat D7 track-type tractors, equipped with bulldozers and/or pulling Davis disc plows, go into the field to prepare the land for the new planting by eliminating the old cane crowns and filling field irrigation furrows on ditches, and low spots which have developed in the field after several harvests.



Employees of Aspillaga Anderson Hnos. designed a special pusher rake for attachment to D4 Cat tractors. These bunch the hand-cut, windrowed cane so it can be loaded easily onto trucks.

The plantation operates a narrow gauge railroad. The locomotive pictured is a Plymouth, powered by a Caterpillar diesel.



Decentralizes Operations

The formation of the Ross Heat Exchanger Division of American Radiator & Standard Sanitary Corporation with headquarters in Buffalo was announced recently by Joseph A. Grazier, president of American-Standard. The new division will conduct the operations in the heat exchanger field formerly carried on by Kewanee-Ross Corporation, including the operation of the plant at 1407 West Avenue here. Kewanee-Ross is being dissolved in accordance with the policy of divisionalizing American-Standard activities along major product lines, Mr. Grazier said.

At the same time, the Kewanee Boiler Division is being established to conduct the steel boiler activities of the dissolved company. Officers of the new Ross Heat Exchanger Division are John C. Linsenmeyer, president; Richard S. Reade, executive vice president; John W. Gudgel, vice president, sales and marketing; and Townsend Tinker, vice president, engineering, research and development.

Texaco Expands Service

F. H. Holmes, vice president in charge of The Texas Company's Research and Technical Department, has announced that Texaco will expand its specialized service to Southern industry by opening a Regional Office of the Technical Service Division in Atlanta, Georgia, January 1. Address of the new service headquarters will be 873 Spring Street, N.W. The office will be under the direction of J. F. Collins, Jr.

"By establishing a regional technical service center in Atlanta," Mr. Holmes said, "Texaco will increase its direct services to this important industrial section. The expansion of our research and technical organization enables us to provide a versatile and extensive program of fuel and lubrication services to an area which enjoys a continuing industrial growth."

"The new office will permit quicker access for Southern industry to Texaco's specialized technical services as well as the Company's widespread research facilities," he added.

Appoints Engineering Personnel

The appointment of Louis M. Campani as chief administrative engineer has been announced by The Liquidometer Corporation, Long Island City manufacturer of liquid level measuring instruments and controls for aviation and industry. Other promotions within the engineering department included: Julius V. DiFranco to chief electrical engineer,

P. Richard Rosenberg to chief mechanical engineer, Edgar Astrove to administrative assistant, and Edward Chowske to supervisor of the Industrial Engineering Group.

Announces New Distributor

Appointment of the Gil Boers Equipment Company of Chicago as distribu-

tors for General Motors Diesel engines has been announced by Robert E. Hunter, general sales manager of GM's Detroit Diesel Engine Division. The company will handle sales and service for both industrial and marine Detroit Diesels in Northern Illinois and the counties of Lake, Porter, La Porte and St. Joseph in the state of Indiana. The company's new activity is housed in a new

building at 7739 Kedzie Street where a complete line of Detroit Diesel parts, the latest factory-approved tools and a dynamometer test room have been installed.

Manager of the company's Diesel division is E. K. Cook. N. D. Cacic is parts and service manager. Both have had many years' experience in selling and servicing the Detroit Diesel line.

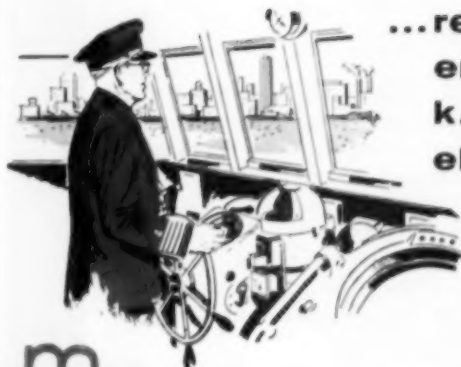
Owner and Operator: Washington State Ferries, a division of the Washington Toll Bridge Authority.
Builder: Puget Sound Bridge and Dredging Co., Seattle.
Naval Architect: W. C. Nickum and Sons, Seattle.
Engines: Built by Cleveland Diesel Engine Division of General Motors Corp., Cleveland.



Marquette

HYDRAULIC GOVERNORS

...regulate the two 1600 h.p. propulsion engines and the two 8 cylinder 200 k. w. generator sets on the Diesel-electric Ferry "Evergreen State".



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Visits Detroit



Gil Boers, president of Gil Boers Equipment Company of Chicago, new industrial and marine distributors for GM's Detroit Diesel Engine Division, is greeted in Detroit recently by Semon Knudsen, Detroit Diesel's general manager (left) and Robert E. Hunter, the Detroit Division's general sales manager (right).

Adds 30 Kenworth Trucks to Fleet



To handle increased tonnages and additional motor freight services, Texas-Arizona Motor Freight Lines, Inc., has added 30 more Kenworth trucks to its highway fleet. The Kenworths, with new 35-ft. trailers, are being placed in operation primarily between El Paso, Texas, and Los Angeles.

They haul a wide variety of commodities ranging from dry freight to refrigerated products. Among the specialized engineering features in Texas-Arizona's new Kenworth trucks is the Kenworth KST four-spring rear bogey which provides excellent riding qualities, stability and ease of maintenance, and supports the frame over a greater length at six points.

The new Kenworth trucks now being added to Texas-Arizona's fleet have 200 hp Cummins diesel engines with pressure-time fuel systems. The Fuller Roadranger transmissions have 10 evenly spaced gear positions selected with a single gear-shift lever. The wheel base is 189 inches and from the back of the cab to the centerline of the rear axles measures 98 inches. Frame rails are of heat-treated chrome manganese alloy steel. Each truck has two 65-gallon fuel tanks.

Replaces Steamer With Diesel Electric

The San Luis Central Railroad of Colorado has replaced a 40-year-old steam engine with a new 70 ton General Electric diesel-electric locomotive on its route between Monte Vista and Center Colorado. The line expects that the new unit will pay for itself in approximately seven or eight years on the savings in operating expenses alone.



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DIESEL PROGRESS

Circle Station Los Angeles 46, Calif.

Volume 20 has received the largest number of advance orders in the 20 year history of DIESEL ENGINE CATALOG! Be certain of your copy. Order now.

Correction

In an article on the Diesel Ship *A. D. Haynes II* which appeared in the January issue, the turbochargers were erroneously credited to Elliott in the picture captions. The turbochargers should have been credited to the De Laval Steam Turbine Company, as they were in the text of the article. The Nordberg Supra-thermal diesels on the *A. D. Haynes II* on which the De Laval turbochargers are mounted have turned in an exceptional performance record.

Issues Marine Gear Bulletin

Bulletin 307 on the new MG-511 marine reverse and reduction gear has been released by the Twin Disc Clutch Company of Racine, Wisconsin. All the advanced features of the new marine gear are described and illustrated, including: unusually short length of 17 $\frac{3}{4}$ -in. from the SAE housing flange to the output propeller shaft flange—rubber block drive—finger-tip control—oil-actuated, oil-cooled, multiple plate clutches—all components easily accessible for servicing—full horsepower operation in both forward and reverse—all gears straddle-mounted on anti-friction bearings.

A copy of Bulletin 307 on the new MG-511 marine gear may be obtained by writing directly to the Twin Disc Clutch Company, Racine, Wisc. **ITS NEW**

In New Job

Don B. Sandford has been appointed manufacturer sales representative, Industrial Power Division, for International Harvester Company, covering Texas and Oklahoma. Sandford, a member of the American Petroleum Institute and a 21-year employe of International Harvester, is well-known in field operations. His entire service with the company has been spent in engineering design and sales engineering. For the past 10 years he has been active in oil field preparations. He now headquarters at the International Harvester district sales office, Dallas, Texas.

Allis-Chalmers Officers

Willis G. Scholl, a group vice president, has been elected executive vice president, Allis-Chalmers Manufacturing Company, and Boyd S. Oberlink has been named vice president in charge of the tractor group by the firm's board of directors. Mr. Scholl started with Allis-Chalmers in 1936 as a salesman in Columbus, Ohio. He later held the positions of assistant branch manager and manager at the Toledo, Ohio branch.

From 1947 to 1951 Mr. Scholl was eastern

territory manager of the tractor division's sales force. He was then named sales manager of the Allis-Chalmers tractor division and in 1952 vice-president in charge of the division, which was reorganized into the tractor group in 1955. He was elected to the board of directors in 1955.

Mr. Oberlink, previously vice president

and general manager of the firm's construction machinery division, succeeds Mr. Scholl as group executive. The tractor group includes the company's construction machinery, farm equipment and Buda divisions. He began working in the Allis-Chalmers tractor division in 1934, shortly after graduating from the University of Illinois and held the positions of assistant supervisor of the allied

equipment department and manager of the division's Washington, D.C. office.

In 1943 he was named assistant industrial sales manager and three years later assistant to the vice president in charge of the tractor division. He was named vice president, tractor division, in 1951 and vice president and general manager, construction machinery division in 1955.

Instant shifts on the go

BIG NEW ADVANCE in shovel-type loaders is the Hough Model HO 4-wheel-drive PAYLOADER.

And one of the biggest features of this 2-yard workhorse is its great new TORQMATIC DRIVE designed by Allison expressly for shovel-type loaders.

Hough calls this integrated TORQMATIC Converter-Transmission team the "easiest-operating, fastest-acting, most efficient power-shift transmission ever put into a tractor shovel."

And they also say that the TORQMATIC DRIVE permits "instant shifting from any speed range to any other on the go—no stopping, no foot clutching."

That means faster job cycles, easier loader operations, more yardage moved per shift.

The HO PAYLOADER is available with either gasoline or Diesel power. The engines will last longer, operate more efficiently driving through a TORQMATIC Converter because it instantly matches engine speed and torque to the load—

multiplies engine torque up to 350% to broaden the working horsepower range.

Today Allison's new TORQMATIC DRIVE is available in many models of shovel-type loaders—will soon be offered in a wide range of other equipment made by leading manufacturers.

If you'd build or buy a better product, get full information on this great new TORQMATIC DRIVE by writing to Allison Division of General Motors, Box 894D, Indianapolis 6, Indiana.



Allison
TORQMATIC DRIVES



MANZEL

FORCE FEED LUBRICATORS

● Used by Leading Diesel Engine Builders because of their Dependable Operation through Years of Hard Service.

Professionally qualified engineering representatives throughout the country.



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Immediate shipment . . . no waiting or delays in receiving your reconditioned cylinder head.

Heads available for most popular makes of diesel engines.

Guaranteed as good as new and up to the manufacturer's original specifications.

Surprisingly low cost. You pay only for restoration and shipping.



DIESEL CYLINDER HEADS

When extended downtime means a serious business loss, call or wire Guth-Pascoe. Guth-Pascoe offers immediate exchange service on most popular diesel engine cylinder heads . . . fully reconditioned, completely guaranteed, ready for instant shipment by the fastest means possible. You get full credit for your old cylinder head upon its return. You pay only the cost of restoration and shipping charges.

The GUTH FUSION PROCESS is a scientific system of rebuilding broken and cracked castings. Developed and patented in many of its phases by Carl R. Guth, its use is supervised every step of the way by a specially trained expert. Do not discard that old cylinder head. It can be replaced at a small fraction of its original cost. When you have a problem, it will pay you to consult Guth-Pascoe.

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1933 East Washington St., Phoenix, Arizona

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Emergency rush service day or night—Sundays and Holidays included

REA Plant Managers Annual Meeting

The Rural Electrification Administration Plant Managers Annual Meeting will convene the first week in April in St. Louis. These annual sessions by REA internal combustion plant managers have been the scene of a profitable exchange of ideas and experience in plant operation and management.

One of the highlights of each of the past four meetings has been the presentation of the DIESEL PROGRESS Efficiency Plaque to the most efficiently operated REA internal combustion generating plant. Again, this year, the plaque will be awarded. The presentation will be made by Rex W. Wadman, editor and publisher of DIESEL PROGRESS. This contest was originated by DIESEL PROGRESS as a means of fostering the over-all efficiency of this large group of diesel, dual-fuel and gas engine users. Selection of the winning plant is based on information forwarded to the Rural Electrification Administration in Washington, D.C. The method of computing the efficiency of each plant takes into consideration the differences in fuel costs and other such variables.

Details on this year's winning plant will be given in the April issue.

Sales Representatives



Malcolm W. Black

Lewis L. Dollinger, president of Dollinger Corporation, Rochester, N.Y., manufacturers of industrial filters, has announced the appointment of Malcolm W. Black & Co., Inc., New York City, as sales representatives for New York City, Northern New Jersey, and Westchester county, effective January 1, 1956. Prior to organizing his firm in 1944, Mr. Black was chief instrument engineer with the Continental Oil Company and a salesman for Manning, Maxwell and Moore.

Mississippi Excursion Boat



Reminiscent of the old Mississippi River Boat days is this new river cruise boat, *Memphis Queen II*, built by the Dubuque Boiler Company, Dubuque, Iowa. Powered by twin 100 hp Graymarine Six-D427 diesels, the boat is shown getting under way on a test run for the Memphis Excursion Lines, Inc., owners. The *Memphis Queen II* is of welded steel construction throughout with the exception of the wood frame pilot house located on the upper deck, amidships.

DIESEL PROGRESS

OGP Division Event

It is anticipated that the 28th Annual Technical Sessions and Exhibits of the Oil and Gas Power Division of the American Society of Mechanical Engineers will draw the largest attendance to date. The usual highly select attendance will include engine manufacturers' representatives, accessory manufacturers' representatives, military personnel, oil company representatives, municipal and utility plant operators, consulting engineers, educators and government agencies, among several others.

The event will be held at the Jung Hotel in New Orleans, April 2-4. Ray Schakel is in charge of the fast going exhibit space. Those firms wishing to reserve any available space for an exhibit should contact him at Diamond Chain Company, 407 Kentucky Ave., Indianapolis, Indiana. Orders should be sent in with a minimum of delay.

A number of papers have been received and panel discussions are being arranged. DIESEL PROGRESS will bring complete details on the various speakers, subjects and discussions as soon as it is made available.

Inasmuch as both the Oil and Gas Power Division Convention and the REA Managers Meeting will take place during the early part of April, the April issue of DIESEL PROGRESS will be a convention issue. Full details of the REA award winning plant will be included as will facts and figures on the four runners up. Advertising forms will close noon, March 10th. A great issue in which to sell your product or service. Don't miss it.

Announces Sales Staff Changes



Norman G. Selland

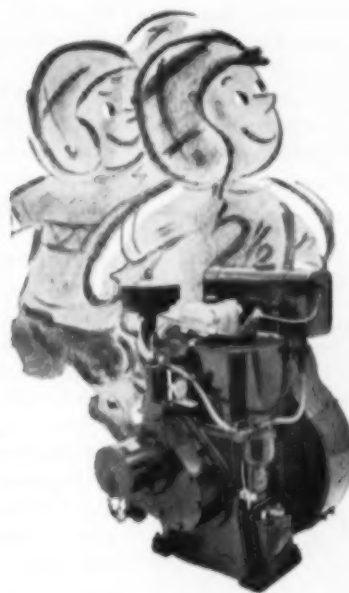
Robert O. Bresee

Norman G. Selland, formerly of the Buffalo, N.Y., office of Electric Machinery Mfg. Company, has assumed sales engineering duties in the New York City office. Mr. Selland joined the company in 1948 after receiving his degree in electrical engineering at the University of Minnesota. The next year he was assigned to the Buffalo office, where he has become one of the leading authorities on ac motor application in that area.

Robert O. Bresee succeeds Mr. Selland in the Buffalo territory. Previously he was assigned to the Dallas office, and is an electrical engineering graduate of South Dakota State College.

IT'S HERE! JUST OFF THE PRESS! Bigger, better, completely revised, rewritten and brought up to date. It's Volume 20 of DIESEL ENGINE CATALOG, now ready for mailing. Mail orders are now being filled for this giant reference book with its all-new, profusely illustrated engine and accessory section. Be sure of your copy of this limited edition, which costs \$10 postpaid plus California sales tax where applicable. Send checks or company form orders to DIESEL PROGRESS, Cole Station, Los Angeles 46, California.

FEBRUARY 1956



PETTER for rugged power in junior sizes

**Aircooled and Watercooled
2½ to 48 hp diesels for every
industrial and marine need**

There is a ready-made Petter diesel for all these low power applications—at gasoline engine cost!

- Generators
- Irrigation Pumps
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Petter diesels are backed by a worldwide Parts and Service organization for the 400,000 engines in use.

Write for information—a few choice distributorships open



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**IT'S RESULTS THAT COUNT . . . and here is 15
YEARS OF EVIDENCE . . . and a manual to help you
get the same protection and economy on ANY
DIESEL, LARGE OR SMALL.**

OUR SLUDGE PROBLEM IS COMPLETELY LICKED

Having recently overhauled our 3-71 G.M. we found it as CLEAN AS NEW. We replaced camshaft bearings, and this was THE FIRST TIME the front and rear covers had been removed from this engine in OVER EIGHT YEARS OF SERVICE, no sludge whatsoever. We have used Briggs on all of our equipment for the past FIFTEEN YEARS.

WE HAVE VASTLY REDUCED FUEL AND OPERATION COSTS

We never change oil in these engines unless it becomes diluted with Diesel fuel or water. By having oil samples analyzed at regular intervals, we are able to discover dilution and get at the trouble before damage is done.

(signed) S. F. Hamilton, Mechanic and Operator
for INDIAN RIVER FARMS DRAINAGE DISTRICT,
VERO BEACH, FLORIDA



**OIL
FILTERS**

**THIS SMALL MANUAL SHOWS
YOU HOW... WRITE FOR IT
...NO COST.**



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RIVER ROAD, DEPT. 85
WASHINGTON 16, D.C.

LET'S SEE IT!

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COMPANY _____

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Midwest Diesel Notes

By L. H. Houck

A BUCYRUS-ERIE 15-B shovel with a UD-350 International engine, has been delivered to Kentucky-Tennessee Clay Co., for ceramic clay stripping, by Brandeis Machinery Co., Evansville, Ill.

WAYNE COYNE, Wichita, has bought an Autocar truck with a 180 hp Cummins, to be used in hauling produce for Sturgeon & Meeker Co. Sale was through Wichita White Co.

BOONE COUNTY Court, Columbia, Mo., bought a 112 Caterpillar grader from Fabick & Co., Jefferson City, Mo., to be added to the county road fleet.

C. A. BLINNE, Rolla, Mo., has taken delivery on an HD-5 Allis-Chalmers with a 2-71 GM diesel from Riney-Ryan Tractor Co., Fulton, Mo. It is to be used in custom work.

ROY C. STOCKMAN, Jefferson City, Mo., has taken delivery on a D4 Caterpillar tractor, 60-inch tread with hydraulic controls for tool bar, dozer and sub-soilers, to be used in farming.

B. & P. COAL CO., Cadiz, Ohio, has placed a Bucyrus-Erie 54-B shovel in service. It is powered with a 250 hp, Model LI-600 Cummins supplied by Cummins Diesel of Northern Ohio, Inc., New Philadelphia, Ohio.

AN IRRIGATION deep well turbine in Meadow, Utah, has been powered with a 300 hp Model NHRPS-600, Cummins supplied by Cummins Intermountain Diesel Sales Co., Salt Lake City, Utah. Owner is Cleon Stott, at Meadow.

MISSOURI STATE Highway Department has placed a 112 Caterpillar Motor Grader in service at Tuscumbia, Mo., from Fabick & Co., Jefferson City.

ROY SCHAFERKOETTER, Union, Mo., has purchased a TD-9 International tractor with a Drott loader for custom work, from Missouri-Illinois Tractor Co., St. Louis.

BRANDEIS MACHINERY & Supply Co., Paducah, Ky. delivered a Bucyrus-Erie 22-B shovel with International UD-525 diesel, to Denny Kollhner at Anna, Illinois.

GALION MOTOR graders, a pair of Model 104's, with GMC 3-71 diesels went to the Graves Co., Mayfield, Ky., from Brandeis of Paducah.

FRENCH LICK Sandstone Co., French Lick, Ind., took delivery on a 210 Ingersoll-Rand air compressor with General Motors 451 diesel, from Brandeis at Evansville, Indiana.

A CATERPILLAR D4600 power unit with enclosed Twin-Disc clutch has been delivered to the Moniteau County Agricultural Improvement Assn., for use in a limestone quarry, by Fabick & Co., Jefferson City, Mo.

H. D. THOMAS, Rolla, Mo., has purchased a Lorain L-25 with a Cat D-315 engine, backhoe attachment and 30-inch bucket from Fabick & Co., Jefferson City, for use in sewer contracting.

ST. LOUIS Slag Co., Granite City, Ill., has taken delivery from Missouri-Illinois Tractor Co., St. Louis, on an International TD-14 with Drott loader, for handling slag.

BILL BLASDELL, who hauls for M. Brueger & Co., Wichita, Kansas, has put a new Autocar on the job with a 180 hp Cummins, from Wichita White Co.

WESTERN TRUCKING Co., St. Louis, has repowered an over-the-road International truck with a 175 hp, Model JT-6-B Cummins from Cummins Mo. Sales Co., St. Louis.

JOHNSON-KEWITT Const. Co., Louisville, Ky., has a new 600 Ingersoll-Rand compressor powered with a 6-71 GMC diesel from Brandeis Machinery & Supply Co., Evansville, Ind.

KEOSHA COUNTY Highway Commission, Keosha, Wisc., has repowered an Autocar tractor with a 150 hp Model JBS-600 Cummins diesel, from Cummins Diesel of Wisconsin, Inc., Milwaukee.

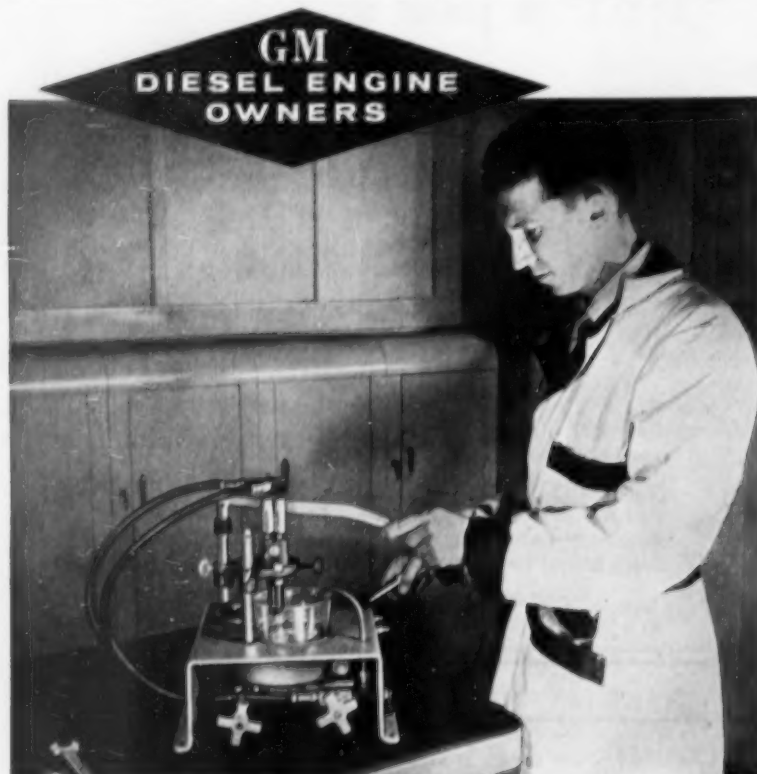
CLAYTON & CROWSON, construction contractors, Fulton, Mo., have taken delivery on a No. 12 Caterpillar motor grader with power steering for used in highway construction, from Fabick & Co., Jefferson City.

J. B. FARMER, Indian, Ark., has placed an Allis-Chalmers HD-16 into tree clearing service. Power is the new A-C diesel. A V-type blade made by Arkansas Foundry Co., Little Rock, is used to fell trees, and a shop-built rake is used on dozer arms to rake up debris for burning. A protective welded steel frame protects the operator. Equipment is used in a land clearing job near Eudora.

Excellent Performance Record

The two Model 6-110 GM diesel engines owned by Bill Pearl of Freer, Texas have piled up an excellent record in the three years that they have been in operation on a mud pump. The engines were sold by the Corpus Christi branch of Stewart & Stevenson Services, Inc.

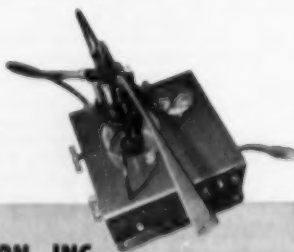
Mr. Pearl has drilled an unusual amount of holes in the three years that he has had these engines. In 1955 he drilled 45 wells with an average depth of from 3000 to 5500 feet each. The rig has seen very little idle time since the engines were installed and the units have now between 17,000 and 18,000 actual operating hours on them. In spite of this operating time, neither of the engines has been overhauled since being placed in service. Mr. Pearl reports that only minor repairs have been necessary with negligible expense incurred. Both engines are running now and Mr. Pearl advises the performance is from all indications the same as when the engines were new. Mr. Pearl also has a GM Twin Model 12107 torque converter unit on the drawworks of his rig.



NOW! One Tester for ALL GM Diesel Injectors! IT'S THE NEW KENT-MOORE *RATE-MAKER*, INJECTOR TESTER FIXTURE

Yes, now for the first time you can check *all* GM Diesel Injectors on *one* tester! That's right. The six tests specified for all Series 51, 71 and 110 engine injectors can be performed quickly and easily on the new Kent-Moore Injector Tester . . . and there are no special conversion units or individual holding fixtures to bother with either! Consider, too, some of the Tester's other outstanding features . . . a clear view plastic container that permits safe, unobstructed observation of the spray pattern . . . a positive lock, fine-adjustment popping handle for greater accuracy in checking leaks at pressures higher than the normal valve opening pressure of the injector . . . a fine mesh screen and ten-micron filter to guard against fuel system contamination . . . a sturdy 3,000 pound gauge with "lazy" hand for faster testing . . . oil resistant hoses and nylon-sealed connector fittings to insure long tool life. All these features, and many more, make it easy to see why the Kent-Moore Injector Tester is specified in your maintenance manuals. Order yours today!

The complete J 7000 Injector Tester, as illustrated at right, includes the basic testing instrument, J 5764, plus three adapter sets . . . J 7051-1, J 7071-1, J 7110-1 for testing Series 51, 71 and 110 injectors respectively. The adapters are offered separately for purchase in any combination desired. For complete information, write Kent-Moore direct today!



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ENGINEERS AND MANUFACTURERS OF SPECIAL AUTOMOTIVE SERVICE TOOLS AND EQUIPMENT

Inland River Reports

By C. L. and A. D. Burroughs

SEVENTY-FIVE diesel towboats, ranging from 100 hp to 4200 hp were completed during the year 1955, for inland river service along with 2 additional river towboats all dieselized, currently shipyards.

BUDA ENGINES power the new 580 hp *Moss Bluff*, a part of the past year's production at the Lockport Shipyard. This small mighty 64.8 by 24 by 8 foot craft easily handles three loaded barges for her owners, Coyle Lines, Inc.

THE *Capt. Reggie M. Dales*, another new vessel of the past year for the Merry Shipping Co., Augusta, Ga., and carrying the name of the late general manager of that firm is establishing a fine performance record on the Savannah River. It is equipped with GM engines providing the 450 hp, along with other equipment such as Kahlenberg, Fairbanks-Morse, Kohler, Beebe and other well-known names.

WARNER COMPANY'S *Christina* built by Alexander Shipyard at New Orleans in 1955 uses her 2,000 hp developed from two GM engines to promote the push-tow system on the Delaware River. Her river appearance caused considerable comment when she was in the Gulf waters before going on the Delaware.

IN THE LOWER Mississippi River trade, the new *Ora D II*, owned by Vest Towing Company, Greenville, Miss., is earning an excellent reputation with power provided by the two Caterpillar engines in the hull 75 ft. by 20 ft. developing the rated 1,000 hp.

GREENVILLE Towing Company's new *Ben McCool* was completed just in time to come under the 1955 mark at Nashville Bridge Company. With a hull size 100 ft. by 30 ft., it is one of the larger boats in the area with the rated 1800 hp developed from the GM engines.

NEAR COMPLETION for the Sioux City and New Orleans Barge Lines, Inc., is the yet unnamed craft equipped with Enterprise engines to operate through the 3:1 reduction gears.

SOON TO SEE service is another unnamed towboat near completion at St. Louis Ship for the M-W-T Company. This twin-screw vessel will be equipped with Cooper-Bessemer engines rated at 2400 hp.

TWO OF THE new 498 series of the GM (Cleveland) engines will provide the power for the new vessel recently

ordered from the Nashville Bridge Company by the Nashville Coal Company. The new scheduled craft is to measure 175 x 42 feet.

A 2,000 HP Superior engine will power the *Price-Bros-McCling, Inc.* (Toledo, Ohio) dredge. It is reported to be the first engine sold by White with the improved output, supercharging and exhaust manifold improvements giving the 2000 rated hp from the model formerly producing 1765.

AMONG THE two dozen or so diesel inland river vessels wearing new names during the year is the *Konrad*. Formerly known as *Papa Lere*, built in 1936 and owned by the Potter Towing Company, this 600 hp craft is powered by a Superior engine and now owned by West Tennessee Limestone Co.

THIS SAME limestone company purchased another favorite, the *Lucinda Clark*, powered by a Kahlenberg engine providing 400 hp for their increasing limestone traffic.

JOAN E., one of the most active and frequently seen towboats on the inland rivers with her Enterprise engines producing 2500 hp is now owned by Cargo Dispatch Company.

JEFFERSONVILLE Boat and Machine Company (Jeffboat) at Jeffersonville, Indiana reports the initial stages of construction on a large towboat for the American Barge Line Company. This twin-screw craft will be rated at 3200 hp. Name of boat and make of engines were not disclosed at the time of this announcement.

THE BARKER Barge Line's new boat, 76 ft. x 24 ft. x 9.3 ft. is expected to be completed at Lockport Shipyards (La.), by early February. With sleeping room for 10 persons, the two Enterprise engines will be installed at the machine shop of the Barker Lines at Lockport.

CAPT. DONALD L. Steele, general operating manager of Federal Barge Lines announced that his company has placed an order with St. Louis Ship for another 3,600 hp boat for Missouri River service. Expected to be completed by July 1956, this new boat will have the same general design and planning of the *Lachlan Macleay* with the same GM power from the four GM diesel engines rated at 900 hp each.

CAPN JOE, built by Dravo in 1954 and owned by Capt. Edward Smith, Pittsburgh, was using the power from Atlas Model 35 engines for active Ohio River duty with two barges of steel, four oil barges, and a pipe barge.

Trucks for the Construction Industry

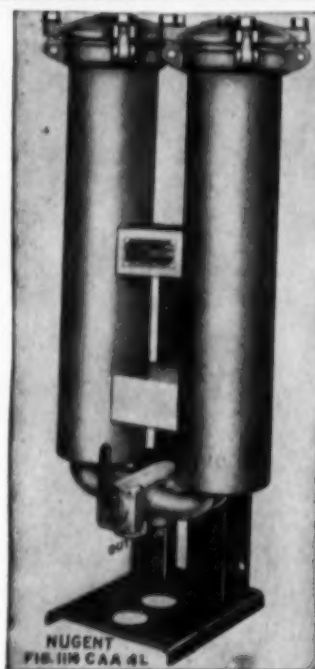
The White Motor Company has issued a new sales folder with the title "Facts About White Six-Wheelers For The Construction Industry" with pertinent data for maximum efficiency of trucks in all phases of the construction industry. The booklet, prepared by the Market Research Department of White,

treats with special background information concerning engines, frames and axles for both on and off the road service in various construction operations.

Copies of the booklet are available on request from Advertising Department, The White Motor Company, Cleveland 1, Ohio, or from your nearest White representative.

ITS NEW

NUGENT FUEL OIL FILTERS



Shown above is a Nugent Duplex Fuel Oil Filter of the type installed as original equipment on the propulsion diesels serving the Flota Mercante vessels. Recharges are inexpensive bag type — easy to replace.

Original Equipment for Merchant Fleet

SHOWN above is the *Ciudad de Cali*, one of the newest in a fleet of Cargo ships built for Flota Mercante Grancolombiana, S.A. Each of these vessels is powered by a 4275 shp Nordberg Marine Diesel equipped with a Nugent Fig. 1116 CAA#4 Duplex Fuel Oil Filter. Auxiliary power on each of the vessels is supplied by a Nordberg Supercharged Diesel Generating Unit equipped with a Nugent Fig. 1116 DAZ#0 Duplex Fuel Oil Filter. The Grancolombiana installations are still another example of Nugent filters being included as original equipment by a leading diesel engine manufacturer.

By actual test, Nugent filters of the above types remove 99.8% of all foreign solids from the fuel oil supply. With either model, the duplex units can be operated in parallel; or one at a time to allow cleaning without interrupting operations. Slow manipulation of the valves will not cause stoppage or high pressure. These are only a few of the reasons why Nugent Filters are selected as original equipment by leading diesel engine manufacturers.

Write for complete information on how Nugent can solve your own fuel or lube oil filtering problems. There is a Nugent Filter of the right size and type for every job.



Wm. W. Nugent & Co., Inc.
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OIL FILTERS, OILING AND PUMPING SYSTEMS, THERMO-COPIC OILERS, OILING DEVICES, SIGHT FEED VALVES, FLOW INDICATORS

Representatives in Boston, Chicago, Cleveland, Detroit, New York, Philadelphia, St. Louis, St. Paul, San Francisco, Seattle, and other cities. Write for complete information on how Nugent can solve your own fuel or lube oil filtering problems. There is a Nugent Filter of the right size and type for every job.

Gulf Coast Diesel Notes

By Michael T. Pate

C. A. WILLIAMS, Houston, will power his 63-foot seagoing vessel, the *Clara-Claude*, with a matched pair of General Motors diesels, series 110, models 62203 RA and LC, driving twin screws through 1.5:1 hydraulic reversing and reduction gears. The diesels were furnished by Stewart & Stevenson Services, Inc., of Houston.

CAYTON TOWING Service, Houston, is repowering the *Anna C* with two Caterpillar marine diesels, each of which will develop 300 hp at 1225 rpm. The diesels, obtained from Mustang Tractor & Equipment Company, Houston, are fitted with Capital EC-6000 reversing and reduction gears.

ISLAND CITY Iron & Metal Company, Galveston, Texas, has bought from

Stewart & Stevenson Services, Inc., Houston, a General Motors series 71, torque-converter equipment diesel, rated at 100 hp. The diesel will replace a steam engine on a power crane.

PANAMA-WILLIAMS Company, pipeline contracting firm of Houston, has bought from Big 3 Welding Equipment Company, Houston, 10 25-amp. Lincoln welding generators, each driven by a model DIX4D, 4-cylinder Hercules diesel, rated at 40.5 hp.

ATLAS MAINTENANCE Corporation, New York City, has equipped its own 60 kw generating set with a series 71, model 6030-C General Motors diesel. The engine and generator were unitized on an oilfield skid and housing by Stewart & Stevenson Services, Inc., Houston, who furnished the diesel.

LYLE CASHION Drilling Company, Greenville, Miss., has secured from Houston Engine & Pump Company, Houston,

two model 24 Murphy diesels, rated at 198 hp each at 1200 rpm. They will be used to furnish prime power on one of the company's drilling rigs.

WILSON MANUFACTURING Company, Wichita Falls, Texas, has bought through Waukesha Sales & Service, Inc., Houston, three model VLRDBU Waukesha diesels, rated at 540 hp continuous at 1100 rpm. The diesels will be mounted as prime power on a drilling rig being built for the Morris Hamilton Drilling Company.

GLENN W. KING, Houston, has bought from Big 3 Welding Equipment Company, Houston, a 300-amp. Lincoln welding generator, equipped with a series 71, model 2055, 2-cylinder General Motors diesel.

FALGOUT BOAT Company, Galveston, Texas, has bought from Stewart & Stevenson Services, Inc., of Houston, two series 110, model 62203 RA and LC, 220 hp GM diesels. They are to power a twin screw steel utility boat through 4.5:1 hydraulic reversing and reduction gears.

THE CITY of Hearne, Texas, has bought through the Diesel Division, Fairbanks, Morse & Company, a 12-cylinder, model 38DS8 $\frac{1}{2}$ spark ignited gas engine which is rated at 1920 hp. The engine will be installed in the municipal power plant.

McWILLIAMS DREDGING Company, New Orleans, Louisiana, has bought from Stewart & Stevenson Services, Inc., Houston, a series 110, model 62203 RA General Motors diesel, rated at 220 hp. The engine is equipped with a 3:1 hydraulic reversing and reduction gear.

C. B. DELHOMME, Houston, has bought from Waukesha Sales & Service, Inc., of Houston, a model 10 ROT63 Kohler lighting plant, delivering 10 kw. It will be used as a light plant on a Criscraft.

GULF OIL Company, Export Division, New York City, has bought from Stewart & Stevenson Services, Inc., Houston, a series 71, model 4031-C General Motors diesel, rated at 80 hp. It will be unitized for overseas service by the seller.

PARKER BROS. & Company, Inc., has bought a model SLRDBSU Waukesha diesel, rated at 540 hp at 1100 rpm. The diesel, sold by Waukesha Sales & Service, Inc., of Houston, will repower a centrifugal pump in one of the company's dredges.

C. A. HARRIS, La Porte, Texas, will power his 50-foot towboat *Marvin* with

a series 110, model 62203 General Motors diesel. The 220 hp engine, delivered by Stewart & Stevenson Services, Inc., will drive through a 3.75:1 hydraulic reversing and reduction gear.

WESTERN PIPE Line Constructors, Inc., Austin, Texas, have bought through Big 3 Welding Equipment Company, Houston, eight 250-amp. Lincoln welding generators, each powered by a model DIX4D, 4-cylinder Hercules diesel, rated 40.5 hp.

MARINE CONSTRUCTION Company, Patterson, Louisiana, has secured from Stewart & Stevenson Services, Inc., five General Motors series 71, model 6071-A diesels, each rated 165 hp. Four diesels will be used to equip two 40-foot twin-screw steel crew boats, the other will be installed in a 32-foot steel crew boat.

PATSO SERVICE Company, Houston, has bought through Houston Engine & Pump Company, two model HD-280 Continental diesels, rated 59 hp at 2000 rpm. The closed power units will be used for auxiliary power in offshore drilling operations in South America.

SMITH DRILLING Company, Farmington, New Mexico, has bought a series 71, twin-6 General Motors diesel from Stewart & Stevenson Services, Inc., of Houston. The 260 hp diesel will be used as prime power in an oilwell drilling rig.

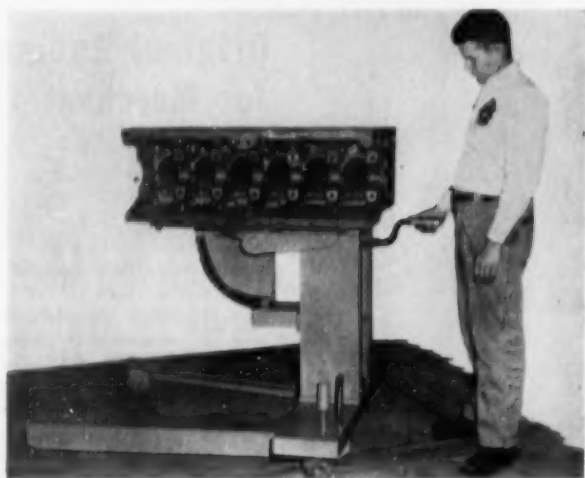
RIVE DRILLING Company, Shreveport, Louisiana, is having installed by the Brewster Company, also of Shreveport, two model 6LRDBU Waukesha diesels. The diesels, rated 260 hp each at 1100 rpm, will power a drilling rig. The engines were sold by Waukesha Sales & Service, Inc., of Houston.

J. S. GISSEL & Company, Houston, has bought from Stewart & Stevenson Services, Inc., two series 71, model 6031-C GM diesel units, each rated 130 hp continuous at 1600 rpm. The diesels are to be installed on the company's inland water transportation units.

GARDNER-DENVER Company, Dallas, has bought from the Diesel Division, Fairbanks, Morse & Company, a model 45B4 $\frac{1}{2}$ 10 $\frac{1}{2}$ hp diesel unit.

SHORELINE DRILLING Company, New Orleans, Louisiana, has bought three Stewart & Stevenson model 6GD-100 100 kw ac generating sets, each powered by a GM series 71, model 6030-C diesel. The company also bought from Stewart & Stevenson Services, Inc., five General Motors series 71, model 24103, quad-6, diesels for drilling rig service. The units are rated 800 hp each.

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Straws in Today's Business News

THERE WERE a total of 906 new locomotive units on order as of late last year, according to a report from the Association of American Railroads. The New York Central will place its lightweight Train X, built by Pullman-Standard and powered by a Baldwin-Lima-Hamilton locomotive, into service this spring. An EMD Aerotrains will be placed in service between Chicago and Detroit, also. The Union Pacific, the Pennsy, the Erie, the Wabash, the Norfolk & Western and the Seaboard have, all told, ordered what amounted to close to a record-breaking number of freight cars. The Pacific Fruit Express is planning a number of standard refrigerator cars and 200 extra-large mechanically cooled cars. Estimated cost to run to \$26,000,000. Also authorized is a conversion of 175 ice-bunker cars to mechanical refrigeration. Pacific Fruit will have 712 MTCs after the conversion.

FAIRBANKS, MORSE & CO. will build six "Trainmaster" diesel locomotives for the Wabash Railroad System. Each engine will develop 4,800 hp when assembled in twin units. Locomotives are for freight and passenger service. New power and equipment orders placed by the system for delivery in 1956 and 1957 may total over \$30,000,000.

THE NEW HAVEN Railroad will extend its "piggy-back" service to mid-western cities. The new service is a step in the program to eventually extend it between points on the New Haven and other points throughout the country. The Pennsylvania RR and other associates have formed a new company to provide "piggy-back" flat cars and an interchange service for them. The pool will have 530 flat cars. Two hundred of the cars to be bought from Van Car Co., plans of which have not been disclosed, are expected to bring high economies in cost, maintenance and operation.

THE U.S. ARMY has awarded a more than \$17 million contract to Continental Motors for 900 engines and spare parts. GM's Detroit Division received a contract for close to \$2 million for auxiliary engines and generators.

EATON MANUFACTURING Company reports a record sales and earnings year. This despite a 9-week strike at the company's axle division. Also announced has been a \$1,250,000 expansion program to increase by one-third the space of its Dynamatic division to 133,000 square feet.

TOTAL TONNAGE carried on inland waterways will not be available until late 1956 but preliminary reports indi-

cate records were broken. The total ton-mileage of barge traffic for the nation's system of 28,996 miles of inland waterways will show a six percent gain over 1954 . . . an estimated 87,500,000,000 ton miles. More than 700 inland waterway craft were launched with greater production anticipated in 1956. An October 1955 report showed fifty shipyards with 144 craft on their ways. This includes 26 towboats, 13 tugboats, 24 oil and chemical barges, 21 hopper barges, 19 drilling and derrick barges, 15 covered cargo barges and a number of miscellaneous craft.

UNION OIL COMPANY of California has asked for bids on the construction of its Phoenix, Arizona pipeline terminal and facilities. Expected to be completed this year, it will provide 67,000 barrels of storage capacity and make the direct receipt of gasoline and diesel fuel possible from the Los Angeles refinery. The Pacific Northwest Pipeline Corporation has received authorization to import Canadian natural gas into the Pacific Northwest. The firm will build 955 miles of pipeline from the Canadian border. An estimated 303 million cubic feet of natural gas will be piped in daily.

AN UNDERWATER pipeline, the longest placed in operation in the Gulf of Mexico has been submitted for approval by the FPC. According to plans, two lines, about 800 feet apart will parallel the Louisiana shoreline from the Sabine River on the Texas border to the Pearl River on the Mississippi border. It will be about 360 miles long and run 25 miles offshore through the major offshore production area. One line will carry crude and the other gas. The Offshore Gathering Corp. is sponsoring the project.

THE UNION PACIFIC Railroad has ordered fifteen 8,500 hp gas turbine-electric locomotives from the General Electric Company and has expressed intention of ordering two additional blocks of 15 locomotives each. Union Pacific currently has 25 gas turbines in service. (See DIESEL PROGRESS, Jan., Feb. and March 1955.) General Motors has successfully tested a new small gas turbine for motor cars. It, according to GM President Harlow H. Curtice, "gives promise of being able to operate with substantially the same economy as present day (gasoline) engines." A regenerator which recaptures 80 percent of exhaust heat is the key to its economy.

New Company Formed

F. M. S. Best, managing director of Rootes Motors (Canada) Ltd., A. G. S. Griffin, managing director of Triarch Corp. Ltd., D. C. Russell, treasurer and director of Rootes Motors (Canada)

Ltd., and H. B. Edwards, sales manager of Canadian Lister-Blackstone Ltd., have been appointed directors of Canadian Lister-Blackstone Ltd., it has been announced jointly by Sir Percy Lister and Sir William Rootes, both of whom will also serve on the board. The new company, with head offices in Toronto and plants in Vancouver and Montreal, is sole concessionaire in Canada for the internationally-known line of British-made Lister and Blackstone diesel engines, for marine, stationary and industrial use, covering a range from three to 600 hp. Lister engines were first marketed in Canada in the late 1800's.

Named to Oklahoma Office

The Trane Company, La Crosse (Wis.) manufacturer of air conditioning, heating, ventilating and heat transfer equipment, has announced the appointment of William L. Mullins to its Oklahoma City sales office. Mullins has previously

been associated with the Trane office at Memphis. A graduate of the University of Louisville, Mullins has a degree in civil engineering. He also completed the Trane graduate training program, and is a veteran of several years' engineering experience.

New Liquidometer Booklet

A new booklet (Bulletin 546) covering Liquidometer capacitor type fuel gaging systems has been made available by The Liquidometer Corporation, Long Island City, New York. The new booklet describes true weight gaging systems, compensated and uncompensated capacitor type fuel gages, repeater, indicators, fuel gage totalizing systems, selective indicators and thermistor applications for fuel level warning and control. Copies may be obtained from The Liquidometer Corp., Dept. S, Skillman Ave. & 36th Street, Long Island City 1, New York.

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The purpose of this little advertisement is to tell you about Volume 20 of **DIESEL ENGINE CATALOG** which is now available, entirely revised and rewritten. This is the 20th edition of the book that has earned the name of "the bible of the industry."

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Mid-Continent Diesel News

By Jack F. Cozier

WESCO CORPORATION, Dallas, Tex., purchased a Cat D337 torque converter power unit for repowering a crane from the Dar Equipment Co., Dallas, Tex.

GASO PUMP & BURNER Mfg. Co., Tulsa, Okla., bought two Buda 8PC-2505 natural gas engines to power a Figure 2652 pump for sale to a pipe line company in West Texas. The engines were delivered by Buda Engine & Equipment Co., Tulsa, Okla.

GRAY CONSTRUCTION Co., Henryetta, Okla., repowered a Browning crane with a GM model 3055-C diesel from the Diesel Power Co., Tulsa, Okla. The unit will be used for general contract work.

CITY OF ADA, Oklahoma, purchased a Cat #212 motor grader for street maintenance work from McCormick Machinery Co., Tulsa, Okla.

LAWTON IRON & Metals Co., Lawton, Okla., have installed a P & H diesel conversion unit in a 255A magnet crane. This is a standard P & H 387C-18 three cylinder excavator engine replacing a gasoline engine and supplying a dc generator for handling scrap iron. The sale was made by the Harnischfeger Corp., Dallas, Tex.

ABC CONSTRUCTION Co., Tulsa, Okla., bought a Unit 1020A back hoe powered by a GM 371 diesel engine with torque converter from Midwestern Engine & Equipment Co., Tulsa, Okla.

URANIA LUMBER Co., Urania, La., operates a locomotive converted from steam to a Cummins HR-400 diesel engine with a torque converter.

HAMMON OIL Company, Wichita Falls, Tex., purchased two Cat D342 power units to repower a drilling rig from Darr Equipment Co., Dallas, Tex.

ARKHOMA STEEL Erection Co., Tulsa, Okla., has bought a Unit 1520T crane for steel erection work from Midwestern Engine & Equipment Co., Tulsa, Okla. The crane is powered by a GM 471 diesel engine.

RED CALLAHAN, Pawhuska, Okla., has purchased a Cat D6 tractor with dozer and Hyster winch for oil field work from McCormick Machinery Co., Tulsa, Okla.

RAINBOW DRILLING Co., Coffeyville, Kan., received a 600 cu. ft. Joy air

compressor powered by an International UD-24 diesel for air drilling work from Butler-Sparks Equipment Co., Tulsa, Okla.

GEORGE E. FAILING Co., Enid, Okla., bought a Buda 8HP-326 natural gas engine for installation on a Failing model 1500S rig from Buda Engine & Equipment Co., Tulsa, Okla.

STANDARD INDUSTRIES, Tulsa, Okla., purchased a Cat D8 tractor and a #12 motor grader for general construction and street work from McCormick Machinery Co., Tulsa, Okla.

R. L. OWENS, Oklahoma City, Okla., received two S-7 Euclid overhung scrapers for use on the new turnpike. The nine-yard capacity units are powered by GM 471 diesel engines and were sold by Butler-Sparks Equipment Co., Tulsa, Okla.

BEASLEY CONSTRUCTION Co., Fort Worth, Tex., recently completed steel erection on Fort Worth's new Continental National Bank Bldg., which is the tallest welded steel structure in the United States. Utilized in the job were two Cummins engines, one an HP-600 supply power to an American hoist and derrick and another engine, an NHRS driving a 125 kw generator.

MIDWESTERN Constructors, Tulsa, Okla., bought a Unit 1020A back hoe powered by a GM 371 diesel engine with torque converter. The unit will be used for pipe line work and was sold by Midwestern Engine & Equipment Co., Tulsa, Okla.

PONOTOC COUNTY, Oklahoma, purchased a Cat 955 traxcavator for road surfacing work from McCormick Machinery Co., Tulsa, Okla.

WALKER-NEAR Mfg. Co., Wichita Falls, Tex., has received a Buda 6MO-970 natural gas engine for powering a Walker-Nead spudder. The sale was made by Buda Engine & Equipment Co., Tulsa, Okla.

E. E. BARBER, Fort Smith, Ark., has bought a one yard Link-Belt Speeder powered by a GM 671 diesel engine from Butler-Sparks Equipment Co., Tulsa, Okla. The unit will be used on construction on the new turnpike.

MURRAY GIN Co., Dallas, Tex., purchased a Cat D318 power unit to power extra gin equipment. The sale was made by Darr Equipment Co., Dallas, Tex.

SOUTHWEST WORKOVER, Alice, Tex., has in operation a Franks rig powered by a Buda 6DCS-844 supercharged diesel.

MOORMAN CONSTRUCTION CO., Muskogee, Okla., bought a Cat 955 trax-cavator for material handling on the turnpike from McCormick Machinery Co., Tulsa, Okla.

OVERBY DRILLING Co., Nowata, Okla., purchased a 600 cu. ft. Joy air compressor powered by an International UD-24 diesel engine to be used for air drilling. The sale was completed by Butler-Sparks Equipment Co., Tulsa, Okla.

CITY OF SEMINOLE, Oklahoma, bought a Cat #112 motor grader from McCormick Machinery Co., Tulsa, Okla. The grader will be used for street maintenance work.

Announces Plant Expansion

Mr. Alan Davis, president of Viking Instruments, Inc., has announced a plan to double the plant and production facilities of the Viking Instruments, Inc., at East Haddam, Connecticut. "The increased sales volume in recent months, as a result of the expansion of the company's line of electronic products, has prompted our decision to proceed immediately with this plant expansion," Mr. Davis stated.

The new production facilities will be built on the company's present site at East Haddam, Conn., and will be among the most modern and efficient production facilities in the country devoted to the manufacturing of process controls, annunciator systems, alarm and special indicator systems, and other electronic devices and instruments.

Two Truck Equipment Firms Merge

A new combination of names marks the recent merger of two of the country's oldest and largest truck equipment manufacturers. The merger of St. Paul Hydraulic Hoist with Gar Wood Industries provides a consolidated line of truck equipment which includes Gar Wood-St. Paul dump truck bodies and hoists, hydraulically operated "materials handling" end gates, Gar Wood Load-Packers, winches and truck cranes.

Details Silicone Rubber Products

A new 8-page Bulletin describes the complete line of Silicone Rubber Products made by the Garlock Packing Company, Palmyra, New York. Garlock has been closely associated with the development of silicone rubber as a sealing material, and believes that silicone answers many important needs in industry. Garlock Silicone Rubber Products are said to withstand high or low temperatures; resist sunlight, ozone, and aging; possess excellent dielectric properties; and resist low swell mineral oils at high temperatures, as well as possessing good resistance to a large variety of other chemicals.

Applications described in the Bulletin include molded and extruded parts for appliance, automotive and aircraft products as well as industrial seals.

Copies of the new Bulletin AD 147 are

available from the Garlock Packing Company, Palmyra, New York. **ITS NEW**

New Super Grader

Galion is now in production on a new motor grader, designated as model T-700, which they claim is the world's biggest, heaviest, and most productive motor grader. The model T-700 is equipped with Galion Grade-O-Matic drive which utilizes a GM-Allison torque converter and power-shift transmission to achieve great ease of operation and performance on the job.

The manufacturer states that the T-700 grader was designed and built new from the ground up, and has been work-tested across the country in all kinds of weather and on all kinds of jobs. Every part of the grader is said to be larger, heavier, stronger, more efficient, and specially designed to obtain tremendous "push-power" at the blade—where power means most. The total weight of the Galion T-700, with scarifier, is listed at 40,125 lbs., far outstripping anything in the grader field, and it is powered by a 190 hp Cummins diesel engine.

For complete information on the T-700 motor grader, write The Galion Iron Works & Mfg. Co., Galion, Ohio, or any of their distributors.

Transmission Topics

In the first 1956 issue of Transmission Topics magazine just released by the Fuller Manufacturing Company, Transmission Division, Kalamazoo, Michigan, Watson Bros. Transportation Co., Inc., of Omaha is featured on the front cover and in the lead story.

An article titled "Synchronizer's" presents Fuller's viewpoint on the controversial subject of synchronizers in truck transmissions. A copy of the new Transmission Topics magazine may be obtained by writing to the Fuller Manufacturing Company, Transmission Division, Kalamazoo, Michigan.

Change in 3 Way Solenoid Valve Design

A new packless 3-way solenoid valve that operates by a new principle and is the essence of simplicity has been introduced by the Automatic Switch Co., Orange, N. J. This new internal pilot operated valve utilizes just three operating parts—two hycar diaphragms and one stainless steel solenoid core. Closely fitted parts that jam, sliding glands and stuffing boxes that leak and require maintenance and stroke setting have been eliminated. Simplicity is further emphasized by the elimination of seat re-

grinding or lapping. This valve is a means for securing automatic and remote control of many kinds of machinery, when combined with single or double acting pneumatic or hydraulic power cylinders or diaphragm operated power heads. For complete information, ask for Bulletin 8316 of Automatic Switch Co., 391 Lakeside Ave., Orange, New Jersey.



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480 KW

Superior Gas, 8 cyl. 14 1/2"x18" Model VDSB, 327 RPM, G.E. generator, 2,400 V, 3 ph, 60 cy. Complete with heat exchanger cooling, switchboard, and accessories.

1000 KW

General Motors Diesel, 16 cyl. 8 1/2"x10 1/2" Model 16-278A, 720 RPM, E.M. generator, 2,400 V, 3 ph, 60 cy. Complete with radiator cooling, switchboard, and accessories.

1200 KW

Chicago Pneumatic Dual Fuel, 8 cyl. 15"x22" Model 862-CPS-DF, 327 RPM, E.M. generator, 2,400 V, 3 ph, 60 cy. Complete with radiator cooling, switchboard, and accessories.

350 KW

Superior Gas, 8 cyl. 12 1/2"x15" Model LOC, 400 RPM, G.E. generator, 480 V, 3 ph, 60 cy. Complete with heat exchanger cooling, switchboard, and accessories.

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TEXAS

Crowley No. 10



The San Pedro Tugboat Company had used their tug *Crowley #10* since 1936 powered with a Union diesel which developed 350 horsepower at 280 rpm. As times changed they found that this tug was as dependable as ever but lacked the power to do what was asked of today's tugs. Because the hull and engine were both sound the owners were interested in the possibility of increasing power.

This engine was nineteen years old when it was supercharged. The work was done aboard ship by the regular crew with Union Diesel's assistance. Materials were supplied by the factory ready to install. Only a few make-up pieces had to be fabricated aboard. After the work was completed, her rated horsepower jumped from 350 to 630. The rpm was upped from 280 to 290, and her topline pull increased from 12,500 to 16,000 pounds.

Factory Liaison Man



Peter Ster, Jr., Cummins' manager - Distribution, Peter Ster, Jr., will serve as direct factory liaison man in the Provinces of Ontario, Quebec, New Brunswick, Nova Scotia, Newfoundland and Labrador. Mr. Ster's headquarters will be in

The importance of the Canadian market to Cummins Engine Company, Inc., Columbus, Indiana, has been emphasized with the appointment of a regional manager for eastern Canada with headquarters at Toronto, Ontario. According to L. E. Williams,

Cummins' manager - Distribution, Peter Ster, Jr., will serve as direct factory liaison man in the Provinces of Ontario, Quebec, New Brunswick, Nova Scotia, Newfoundland and Labrador. Mr. Ster's headquarters will be in

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Suite 903, Confederation Life Building, 321 Bloor Street, East, Toronto. Mr. Ster is a graduate of Indiana Technical College, Fort Wayne, Indiana. He joined the Cummins organization in 1951 as a field representative. His most recent post was that of Regional Service Engineer in the Cummins Eastern Regional Office at New York City.

Vice President of Overseas Operation



Robert R. McCartney's rapidly expanding overseas operations. These include registered foreign offices, a large number of manufacturers' agents and three licensed overseas manufacturers of Clark engines and compressors.

The appointment of Robert R. McCartney as vice president in charge of overseas operations has been announced by Clark Bros. Co., Olean, New York, one of the Dresser Industries. In his new position, Mr. McCartney will devote all of his time to the com-

A 1927 graduate of the School of Mechanical Engineering of Pratt Institute, McCartney is a member of the Export Managers Club of New York City. He will continue to make his headquarters at 122 East 42nd Street, New York 17, N. Y.

GM Distributor



R. Widmer Hubbs

Appointment of the Hubbs Engine Company of Cambridge, Massachusetts as distributor for General Motors marine and industrial diesel engines has been announced by Robert E. Hunter, general sales manager of GM's Detroit Diesel Engine Division. The Hubbs Company succeeds Detroit Diesel's former marine engine distributor, the Walter H. Moreton Corporation, and will occupy the same facilities at 9 Commercial Avenue, Cambridge. The new company will

DIESEL MAILING LIST for sale

Blankets the USA, listing names of top executives concerned with maintenance and/or operation of their company's diesel engine equipment.

Lists these executives for Railroads-Bus Operations-Large Contractors-Strip Mines of all classifications-Steel Mills-many other Industrials-operators of River Craft of all kinds-off-the-highway Equipment Dealers-Shops that specialize in Repair and Rebuilding of diesel engines-Quarries-Sand and Gravel Pits-State Highway Equipment Repair Shops-County Repair Shops who use 30 or more pieces of diesel equipment.

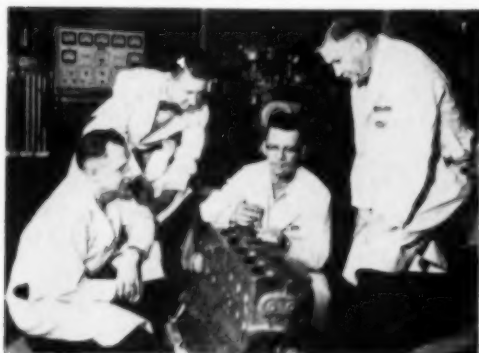
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handle Detroit Diesel marine engines in the states of Massachusetts, Rhode Island, Maine, New Hampshire and part of Connecticut and industrial engines in Massachusetts, Rhode Island and part of New Hampshire.

R. Widmer Hubbs, former president and director of the Harwid Company is president and treasurer of the new company and will direct its operations as general manager. Mr. Hubbs is a graduate of Rensselaer Polytechnic Institute and is registered as a professional engineer in Massachusetts. He makes his home in Swampscott. Most of the key positions in the new company are filled by the personnel of the former distributor's organization.

Study Modern Truck Maintenance Methods



The White Motor Company is holding a series of "Maintenance Management" courses in its Cleveland training laboratory for fleet supervisors and maintenance supervisors from all over the country, as a part of a long-range program to raise the standard of truck maintenance and promote better supervisory methods.

Shown is a group of three of the recent graduates of the course with their instructor, studying a new White Mustang engine. From left to right are John C. Farrell, Joliet Arsenal, Joliet, Ill.; Instructor Frank Novak; Gilbert L. Ritter, Joliet Arsenal, White Motor Sales & Service, Kankakee, Ill.; and Jack Smith, Purcell White Trucks, Inc., Syracuse, N. Y. The men each have a week refresher course in modern maintenance practices and in the use of newest testing instruments and equipment at the factory school.

Purchases 28 Diesel Tractors



E. J. Buhner, chairman of the board, Silver Fleet Motor Express, Inc., Louisville, Kentucky, takes a close look at one of his firm's new White 9000 TD tractors.

With the start of its second quarter century of service to shippers in an eight state area, Silver Fleet Motor Express, Inc. of Louisville, Kentucky, announces the capital expenditure of over \$1,250,000 for new equipment. This purchase consists of 28 Cummins Turbodiesel tractors, and 100 volume van trailers.

In making this announcement, E. J. Buhner, Silver Fleet's chairman of the board, said: "the new diesel trucks will operate primarily south of the Ohio River, and because of their ability to maintain higher average road speeds, we expect these units to improve our service between Louisville and the many southern points in our system."

White Motor Company 9000 TD tractors with 175 horsepower Model JT-6-B Cummins Turbodiesels were specified by Silver Fleet along with 35 foot "hi-cube" Fruehauf trailers. According to Mr. Buhner, these purchases were made following a thorough analysis of the latest types of transport equipment and an exhaustive survey of Silver Fleet's operational needs. All tractors and trailers will be in service by January 1956.

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Equipment may be seen in operation by contacting Mr. Wayne Richardson, Water Superintendent, c/o Water Works Pumping Station, Batavia, Illinois. Bids will be based upon the purchaser removing, crating, and shipping equipment. Bids will be opened in the City Council Chambers at 1:30 P.M. on February 18, 1956.

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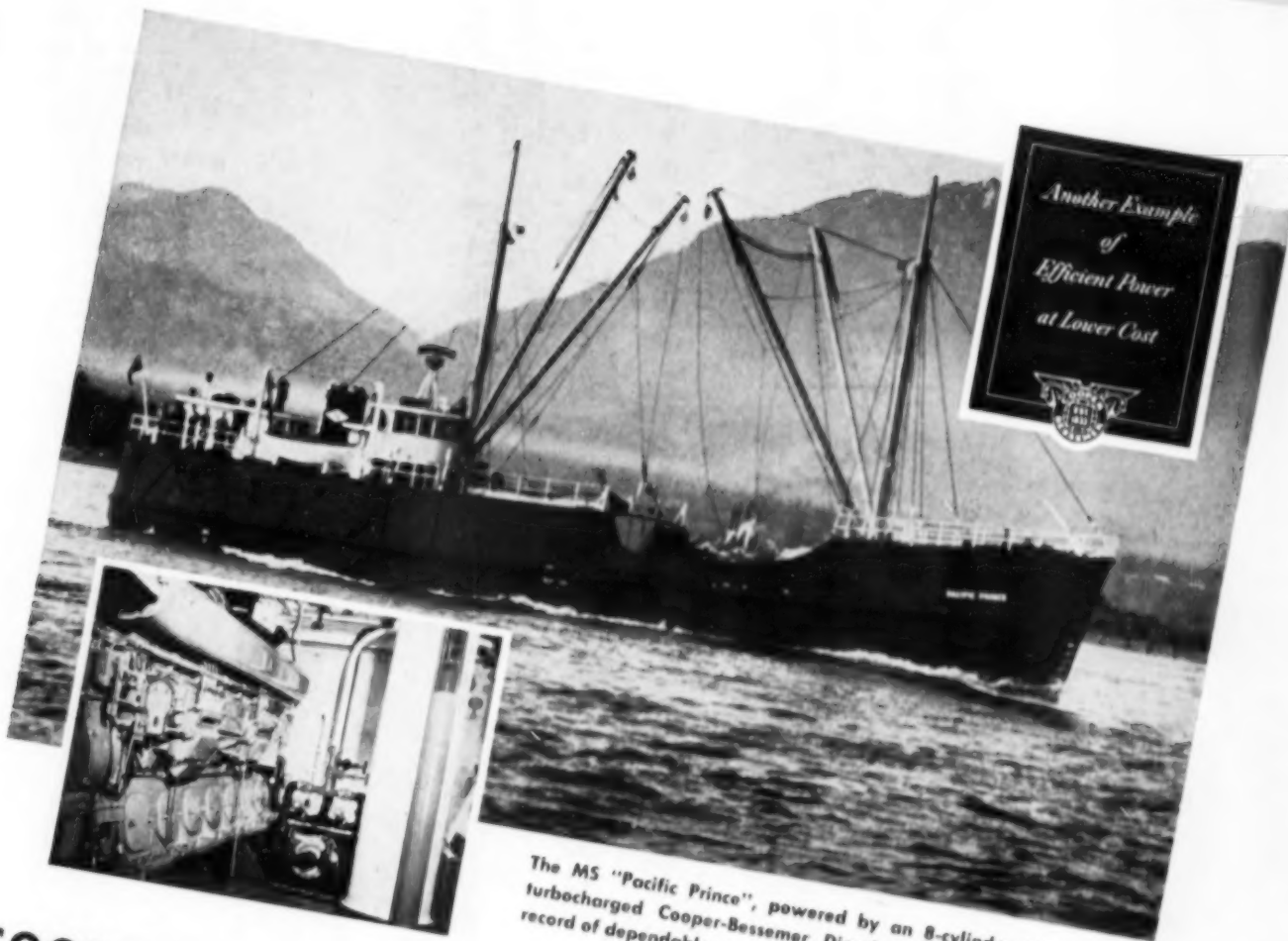
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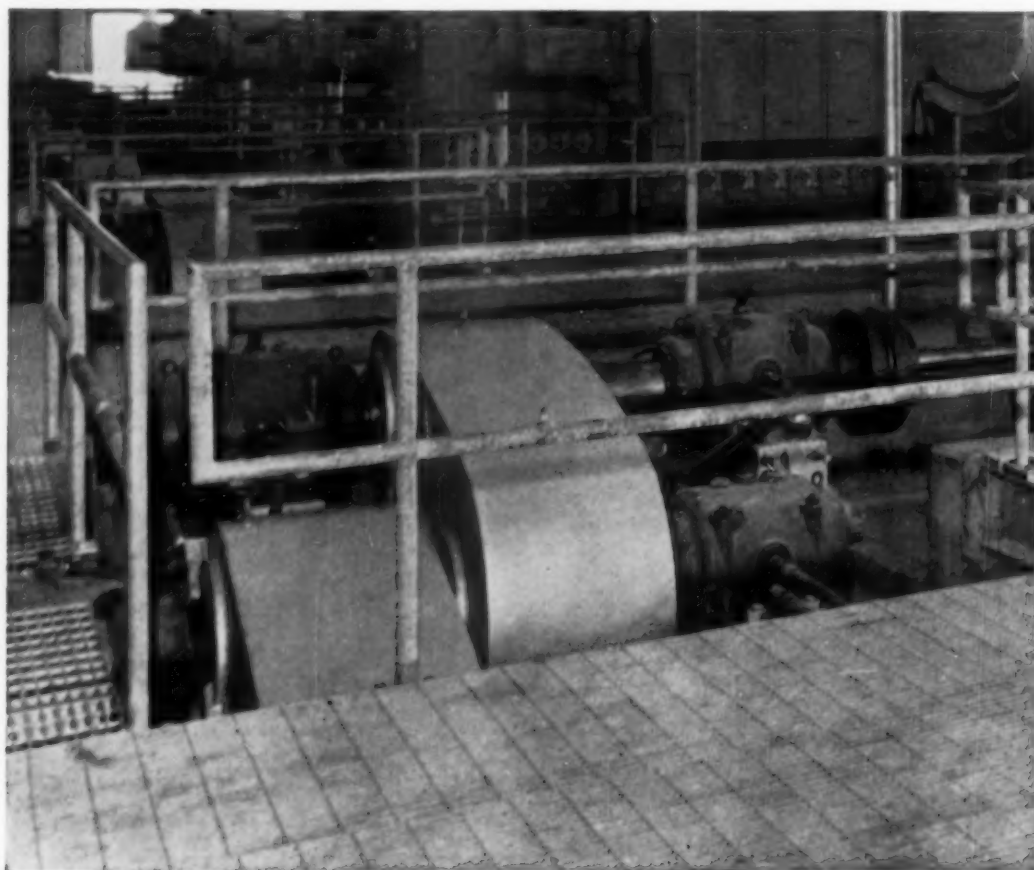
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